ENGINEERING NEWS-RECORD

City street repair: Mechanized science *p. 36*

A McGRAW-HILL PUBLICATION

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UNIVERSITY MICROFILMS IN
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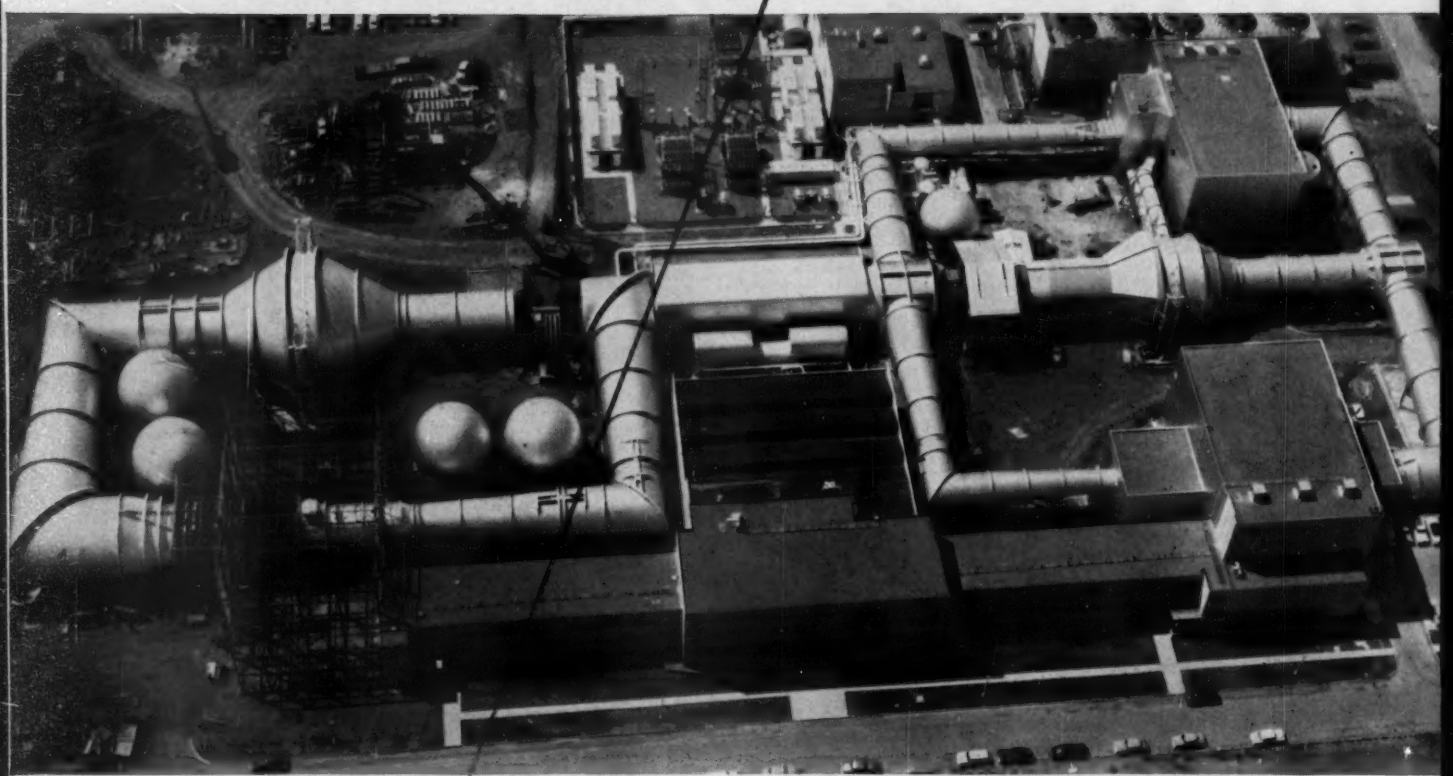
A CB&I Specialized Service

Keyed to Supersonic Flight



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Wind speeds of more than three times the speed of sound . . . the opportunity of carrying out aeronautical research at supersonic speeds on the ground. Such is the mission of the huge supersonic wind tunnel erected by CB&I at Ames Aeronautical Laboratory for the NACA at Moffett Field, Cal. All wind tunnel sections except valves, compressors and test nozzles were fabricated and erected by Chicago Bridge & Iron Company.

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CB&I's engineering staff has been greatly augmented by the specialized aeronautical experience of FluiDyne Engineering Corporation, Minneapolis, Minn. This association completely equips and qualifies Chicago Bridge & Iron Company to provide "turn-key" jobs to the Aircraft Industry.

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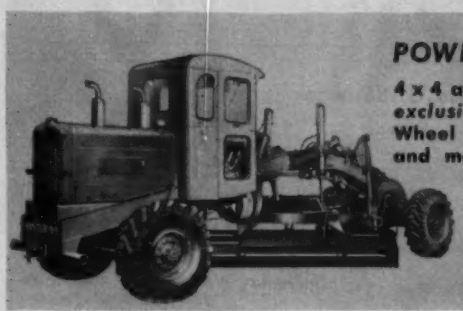
built to Outperform



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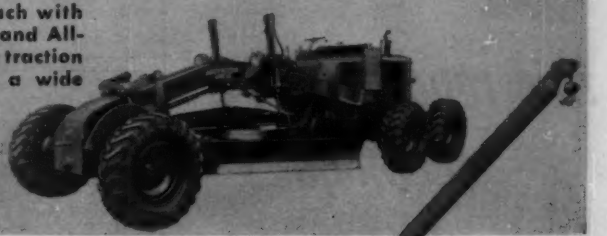
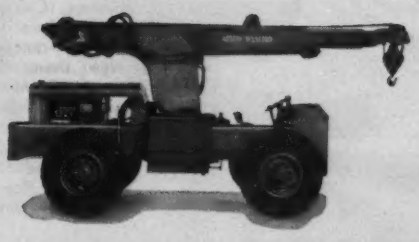
4 x 4 and 6 x 6 models, each with exclusive All-Wheel Drive and All-Wheel Steer for maximum traction and maneuverability, plus a wide assortment of time-saving, money-making attachments.





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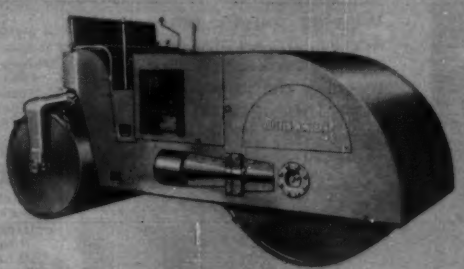

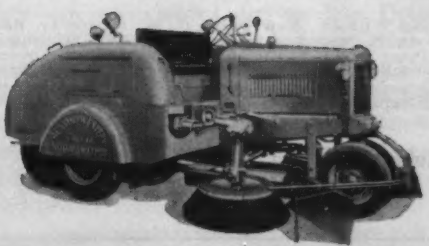

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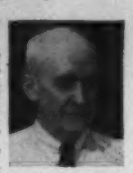

The late Albert Loecher who executed above rendering of U.S. Veterans Hospital, Wilkes-Barre, Pa.
Kelly & Gruzen, Arch's.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H—$1.50 per dozen—less in quantity. The 1001 Mars-Technico push-button lead holder — $1.50 each — less in quantity. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H—$1.20 per dozen—less in quantity.

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PRESTRESSED CONCRETE OFFICE BUILDING

MULTIPLE STORY - CONTINUOUS DESIGN

Office building for United States Fidelity and Guaranty Company, Richmond, Va. . . . Architect, J. Henley Walker, Jr.; Structural Engineer, Wm. J. Blanton; Prestressed members by Concrete Structures Incorporated; General Contractor, Daniels Construction Company, all of Richmond.

COMPLETELY PRECAST and finished months ahead of the best estimated schedule for other materials, this structure cost the owner only $1.62 per square foot per floor level in place.

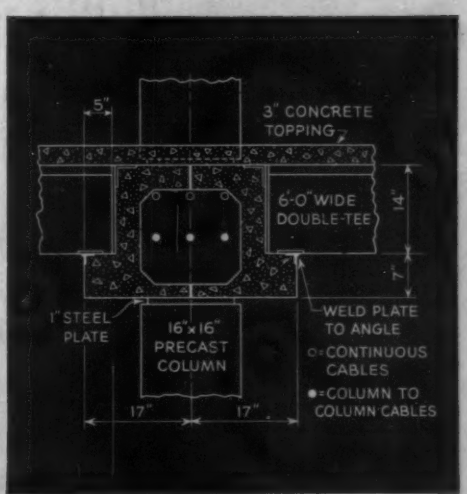
Precast reinforced columns, 32′ on centers, have steel plates welded to girder plates creating a rigid frame.

Hollow girders, precast in halves and assembled into 32′-long members post-tensioned with three cables before erection, have three additional continuous cables added after erection. Hollow was filled with grout after tensioning. Cables are Freyssinet type, each composed of eighteen 0.196″ diameter Roebling prestressed concrete wires.

Each 6′-wide double tee floor section, supported on girders 33′-4″ on centers, is stressed with sixteen ⅜″ diameter Roebling uncoated 7-wire stress-relieved prestressed concrete strands, pretensioned and bonded. Roof double tees have twelve ⅜″ strands.

All precast concrete is 6000 psi ultimate.

Roebling engineers will be glad to give you full information on tensioning materials and fabrication methods. In addition, they are ready to cooperate with you to help attain top efficiency on any given application of this modern and economical structural material. Contact Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.



Details at ground and 1st floor levels. Roof members are similar but have less prestress.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

Harrison & Abramovitz, architects—John B. Peterkin, associate
John W. Galbreath Corporation, owner
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Stainless Steel skin

largest metal-clad building

in the world!

The next time you hit New York City, take special note of the bright new Socony Mobil Building at 42nd and Lexington, because this building is going to make history.

It's the 6th largest office structure in the world; and is completely clad with low maintenance Type 302 Stainless Steel. Directly across the street is the Chrysler Building, the first building to make major use of Stainless Steel for an exterior. Although it was erected in 1928, the [illegible]inless on the Chrysler Building [illegible]till free from corrosion.

Stainless Steel sections can be thin, because it is so very strong, and no allowance for corrosion is necessary. Stainless Steel has such a high melting point that it will meet fire test requirements from inside *and* outside the building.

The Stainless Steel skin requires no maintenance. But if it is desirable to clean it simply for appearance' sake, it's an easy job. Best of all, Stainless Steel exteriors give fine service for the entire projected life of the building.

As the producer of USS Stainless Steel, we have worked closely with the fabricators of Stainless Steel panels for curtain-wall construction. We'll be glad to send you further information and put you in touch with these fabricators. Write to United States Steel, Room 4601, 525 William Penn Place, Pittsburgh 30, Pa.

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UNITED STATES STEEL

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Quickest Way to Get a Refusal

Chrysler-powered jetting pumps help sink 1250 ninety-foot piles into hard-packed sand, averaging 25 per day

Job: foundation for addition to large electric power plant. Objective: bring 1250 ninety-foot timber piles to bear on hard pan underlying tight-packed sand formation. Problem: impossible to drive piles into hard sand with hammer. Solution and method of operation: two Chrysler Ind. 32-powered high-pressure Jaeger jetting pumps operating in parallel or in series as necessity required.

It wasn't that simple, however. Hard-packed sand is never easy to penetrate. Operating in parallel the two pumps discharged 950 gallons per minute at 200 pounds per square inch pressure to blast holes more than eighty feet deep into which the piles sank with only the weight of the hammer. Six to nine minutes of driving with hammer then brought the piles to refusal at hard pan. When greater pressure was needed, the pumps were set to operate in series delivering 475 gallons per minute at 400 pounds per square inch. At many points sand formation was so tight the jet stream would work like a hydraulic piston and send pipe and all shooting out of the ground. To counteract this, extra-heavy pipe weighing over 2800 pounds was used.

Despite difficulties the jetting operation was handled with unusual speed. On the average it took about fifteen minutes to drive a pile to refusal. As many as 33 piles were put down in a single eight-hour day. The two Jaeger Model 5 CPH Pumps and Chrysler Ind. 32—265 cubic inch displacement engines required nothing beyond regular maintenance care.

Assure your users record-breaking performance with top operating economy. Power with *proven-dependable* Chrysler Industrial Engines—230 to 413 cubic inch displacement. A long list of optional equipment enables Chrysler to supply engines to meet end product requirements.

Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices. See a Chrysler Industrial Engine Dealer, or write:

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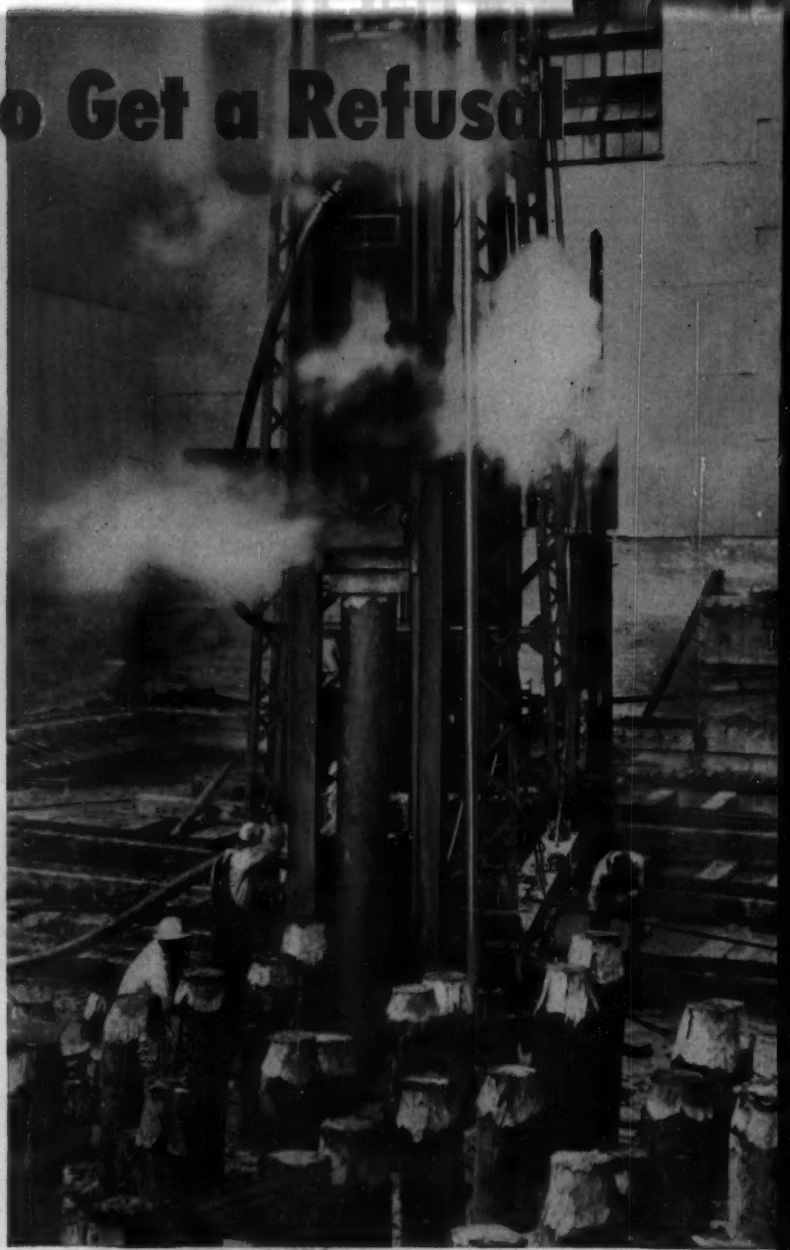

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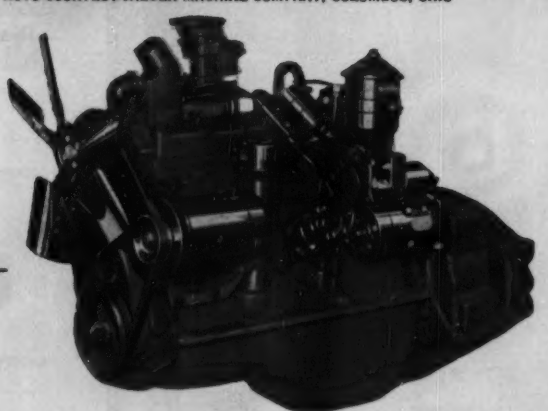

CHRYSLER IND. 32 ENGINE—
265 CUBIC INCH
DISPLACEMENT

CHRYSLER *Industrial Engines*

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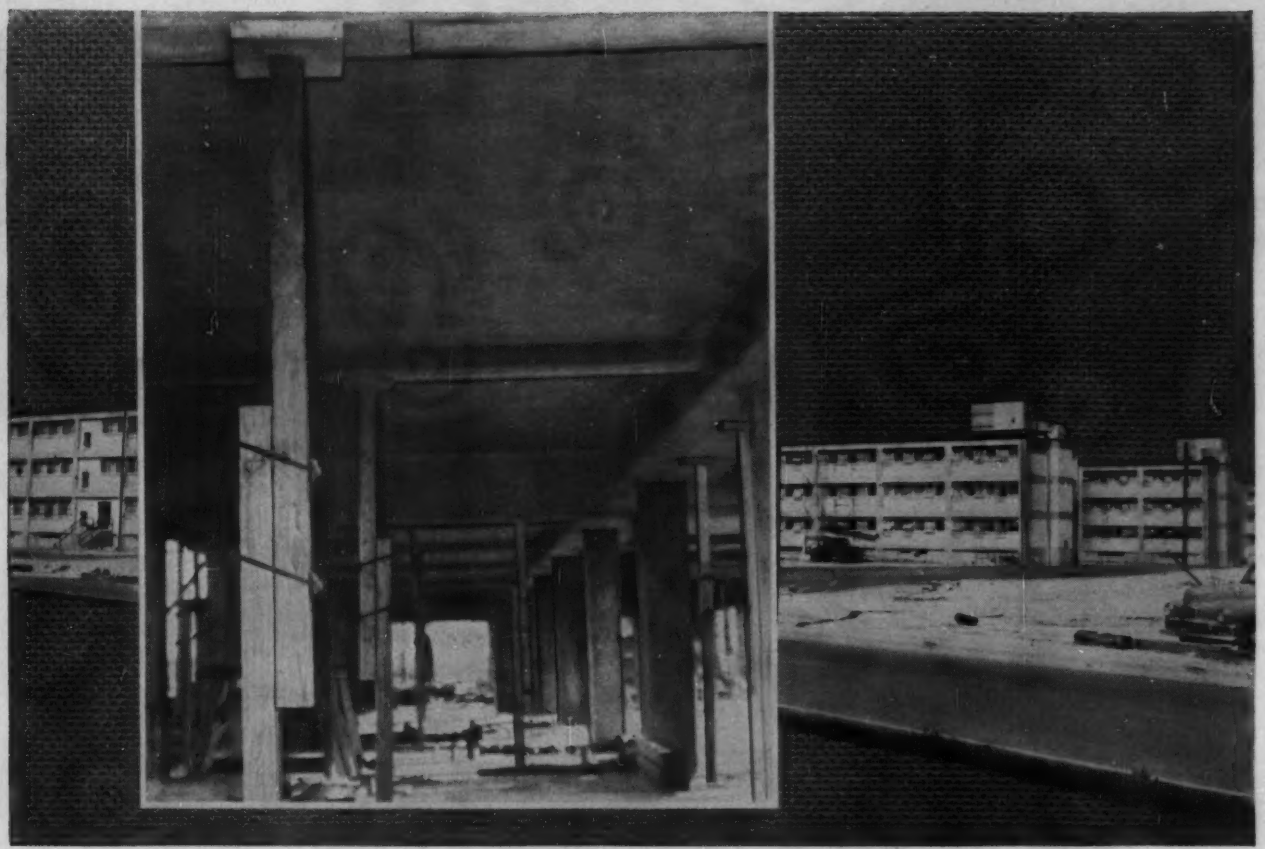

Nine EM Barracks Buildings
Fort Bliss, Texas

Architects: Davis & Foster, El Paso Contractor: Leavell & Ponder
Concrete Slab Form Work by: The Hausman Steel Company, Toledo, Ohio

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MASONITE *Concrete Form* PRESDWOOD

How many times do you use the same form for pouring architecturally smooth concrete? Three? Six? A dozen?

Faced with a "hurry up" schedule, the contractor on the above job found he could successfully pour against Masonite Concrete Form Presdwood® time and again.

The smooth, blemish-free surface of these hard, grainless panels invites repeated use, brings you more savings on material and forming costs.

Concrete Form Presdwood can be worked with ordinary carpentry tools—won't split, splinter or crack . . . can be bent to form arches and columns. Panels are 3/16" and 1/4" thick. Large 4' x 8' and 4' x 12' sizes create fewer fins. Send coupon for a free sample and complete information about this money saver.

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1. Screen side to concrete—for unpainted surfaces. Tiny projections left in concrete cut hand-rubbing costs up to 50%.
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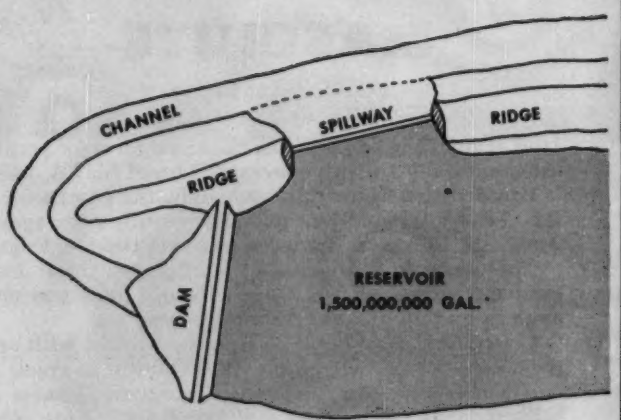
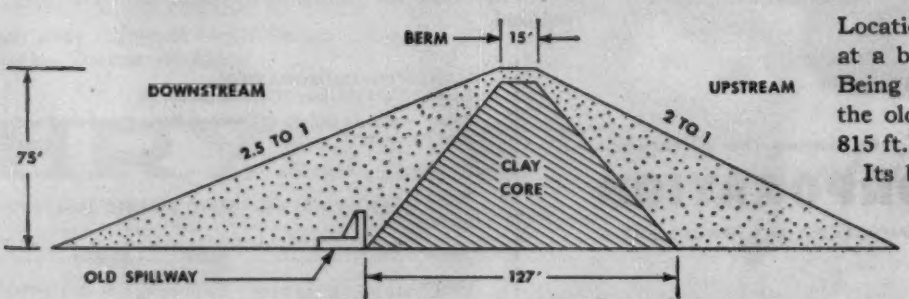
A year ago the work area you see above was the site of a near-disaster. Due to prolonged drought, the 50-million gallon reservoir which supplied Sylacauga, Ala. became completely emptied. For 3½ months, 15,000 people were forced to rely on tank trucks and a nearby spring for their water. Textile, foundry, and quarry industries had to cut production. Fire danger was extremely high. By next year, though, this danger will be just an unhappy memory. A new dam will impound over 1½ ***billion*** gallons of water in a 170-acre, 50-ft. deep reservoir. This will assure the city and its industries of enough water for 8 months, regardless of rainfall.





Location of the dam is between two hills at a bend in a winding stream channel. Being built over the concrete spillway of the old dam, the new structure will be 815 ft. long and 75 ft. high.

Its base will be 353 ft. wide; its top berm, 15 ft. Some 215,000 yds. of compacted clay will form the core; 13,000 tons of native marble, the rip-rap face.

Payscraper speed helps complete 1,500,000,000 gallon reservoir 60 days ahead of schedule

If you'd like to know more about the abilities of International's new Model 75 Payscraper, just ask Ed Bentley, veteran Sylacauga, Alabama contractor.

Mr. Bentley has been using two of these 18½-yard self-propelled scrapers for a season now. He reports they "handle better than any other scrapers I have ever had."

"LOAD FAST, WORK FAST"

"My two Payscrapers," he says, "definitely exceed our expectations in every respect. They load fast, haul fast, and spread fast. My operators like their ease of operation and comfort. I like their day-after-day trouble-free performance."

Pictured is one of Bentley's latest Payscraper jobs—helping move 250,000 cubic yards for a reservoir dam for the city of Sylacauga. Used with a fleet of three International TD-18's, a TD-24, and a Galion grader, the two Payscrapers here combined to average 2,000 to 3,000 pay yards per day. Cycles, averaging 5,000 feet, took about five minutes. This high speed, day after day, week after week, helped Bentley complete work in four months—well under the 180 days allowed in his contract.

CALL FOR A DEMONSTRATION

Let us show you this 18½-yard "75"—or the smaller 13-yard "55" Payscraper—in action on your job. Call your International Industrial Power Distributor to arrange time and place.

• IMPORTANT CHANGES HAVE BEEN MADE

In the past year, International's research and manufacturing staffs have greatly improved the "75" Payscraper. They have raised power to 262 hp (17½ "horses" per yard of struck capacity). They have increased heaped capacity to 18½ cubic yards *without sideboards*. They have strengthened transmission, differential, and final drive, boosted rim-pull, and made over 80 more changes to boost output and lower downtime. If *you* want top efficiency in a rubber-tired scraper, you'll want to check the new Payscrapers. Do it now.

INTERNATIONAL HARVESTER

INDUSTRIAL POWER • MAKES EVERY LOAD A PAYLOAD

Contractor Bentley reports his 161 dhp TD-24 consistently loads 18½-yard Payscrapers in 35 to 40 seconds. "The '24' and my other IH crawlers are my top producers," says Bentley.

Payscraper's open-top speeds loading from TD-9 tractor-shovel. Material is muck—part of 35,000 yards stripped from old dam site by contractor's four TD-18's and 24's.

STEEL
STONE
GLASS
get together and
stay together
with THIOKOL
liquid polymer
This handsome new Socony Mobil mid-Manhattan skyscraper is using DEL — a THIOKOL based caulking compound for lifetime weatherproofing. WHY?
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Thiokol®
RESEARCH PIONEERS IN SYNTHETIC RUBBERS

READERS COMMENT

Pozzolans in Concrete

SIR: The intent of the writer's letter (ENR Aug. 4, 1955, p. 8) concerning the use of pozzolans in concrete was purely to call the attention of contractors and engineers to the existence of a material which can, in many cases, be used beneficially as a partial replacement for cement. The writer does not advocate the arbitrary or indiscriminate use of any pozzolan without prior investigation. No one is more aware of the variations and behavior of different pozzolans than he. In fact, he has just completed a research project in which the effect of variations in temperature of calcination and degree of fineness upon pozzolanic activity were studied. It was therefore precisely for this reason that the reference to Professor Davis' article in ENR of April 5, 1951 was given. Therein one will find most of the answers to the questions and objections raised by Messrs. Durury and Haller (ENR Sept. 1, 1955 p. 12 and Sept. 8, 1955 p. 8).

The 25% figure cited by the writer is not unreasonable for certain types of opaline shales, diatomites, and fly ashes of low carbon content and high fineness. It should be noted that the writer qualified this figure to certain types of construction. After all, it is the heavy construction field that is the biggest consumer of cement and where also the largest savings will be realized.

Quoting from the report of ACI Committee 212 on Admixtures for Concrete (ACI Journal Vol. 26, No. 2, Oct. 1954) " . . . These materials are sometimes used in large hydraulic structures where it is desirable to avoid high temperatures or in structures exposed to sea water or sulphate-bearing waters. When used, pozzolanic materials generally are substituted for 10 to 35 percent of the cement. . . ." Again, concerning use of pozzolans to combat expansion due to alkali aggregate reaction: . . . It has been found that ample protection can normally be obtained by quantities ranging from 20 to 35 percent by weight of the cement. These amounts are usually compatible with other physical requirements of the concrete such as strength, workability, and other properties."

In special Technical Publication No. 99 of the ASTM "Symposium on Use of Pozzolanic Materials in Mortars and Concretes," Professor Davis wrote: ". . . Depending upon the factors previously named, the optimum percentage of replacement may be as

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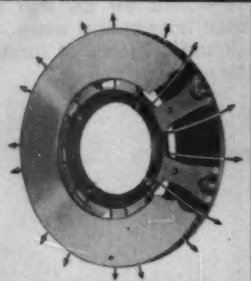

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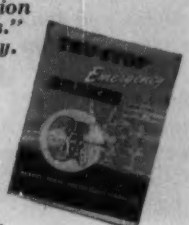

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READERS COMMENT

low as five or six, though for most pozzolans it is not likely to be less than 15 and it may be as high as 40, and for certain properties and a few pozzolans perhaps as high as fifty. . . ."

Therefore even taking the minimum figure of 15% replacement the monthly saving would still be 3,000,000 bbl. or an annual saving of 36,000,000 bbl. To obtain this additional capacity, the capital expenditure for new plant and equipment would roughly have to be $220 million! At the USBR's Hungry Horse Dam in Montana, a saving of $1.5 million was effected by the use of Chicago fly ash on a 30% replacement basis. As may be plainly seen, the savings are twofold.

Mr. Drury says that he does not endorse pozzolans as a cement replacement yet his company has placed 150,000 cu yd of concrete with the "pozzolan replacing from 15% to 22% of the cement." The writer agrees with Mr. Haller on the slow strength development of pozzolanic concrete. However, there are many instances where strength is not the prime requisite. Would Mr. Haller reject the use of air-entraining admixtures since it is well known that, within the range of air content normally used, the decrease in strength is usually about proportional to the amount of air entrained?

Concrete making as an art is on its way out. The trend is definitely toward "engineered" concrete as Mr. Drury so aptly puts it. I think all of us will agree that in view of the cement shortage, pozzolans when properly employed, do definitely have a place in concrete if more people are made aware of their potentialities.

R. G. LEE
Civil Engineer
San Francisco Water Dept.
San Francisco, Calif.

CALENDAR

National Society of Professional Engineers, fall meeting, Peabody Hotel, Memphis, Tenn., Oct. 14-15.

Southeastern Association of State Highway Officials, annual convention, Charleston, W. Va., Oct. 17-19.

National Safety Council, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Oct. 17-21; construction section, Oct. 17-18.

First Western Conference on Asphalt in Hydraulics, University of Utah, Salt Lake City, Utah, Oct. 19-20.

National Council of State Boards of Engineering Examiners, annual meeting, Sheraton-Park Hotel, Washington, D. C., Oct. 20-22.

Institute of Traffic Engineers, annual meeting, William Penn Hotel, Pittsburgh, Pa., Oct. 23-27.

American Society of Civil Engineers, annual meeting, Statler Hotel, New York City, Oct. 24-28.

California Section, American Water Works Association, meeting, Memorial Auditorium, Sacramento, Calif., Oct. 25-28.

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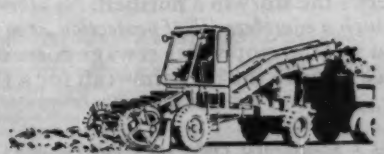
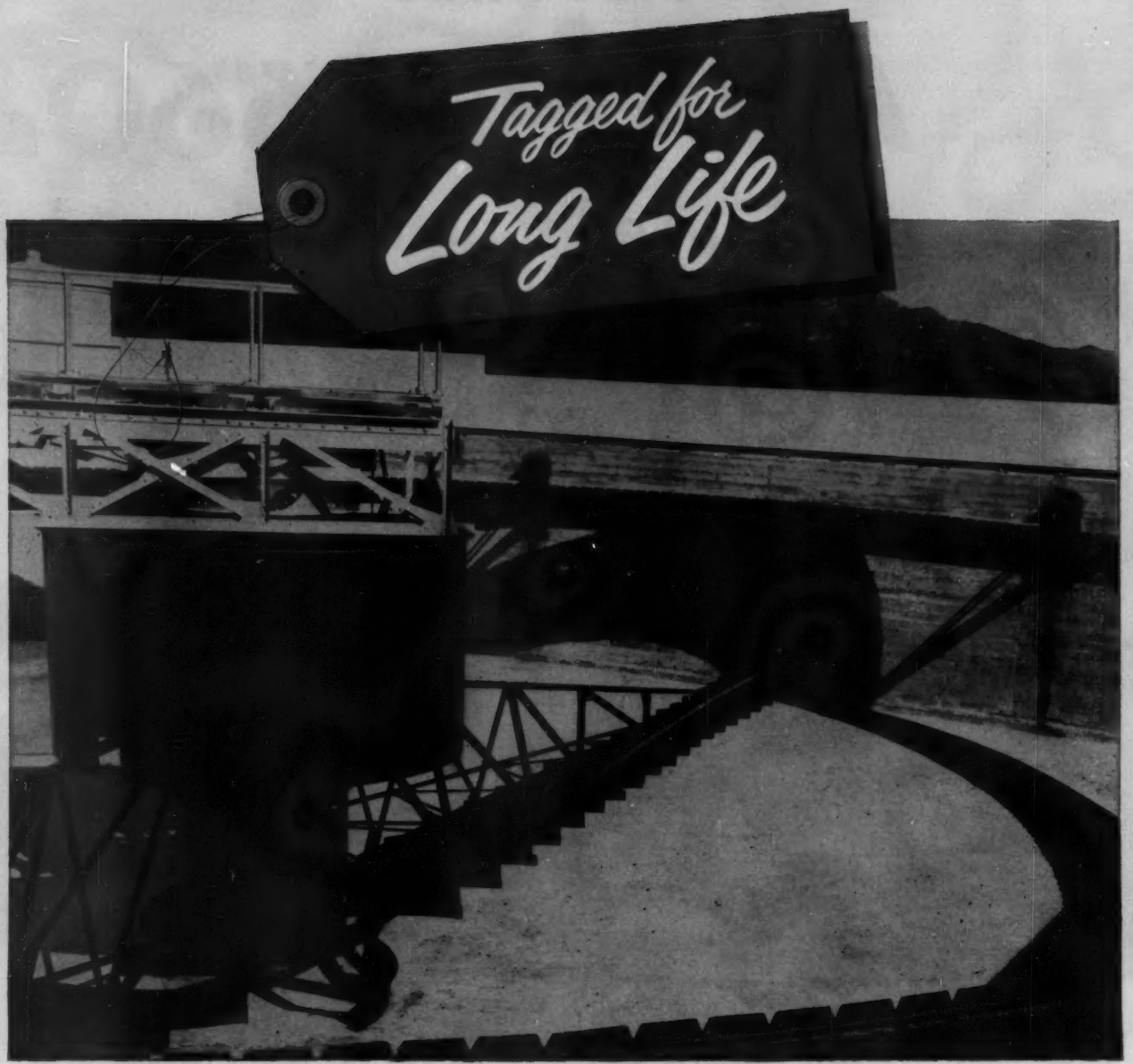


Motor Graders TraveLoaders Pull-Type Graders



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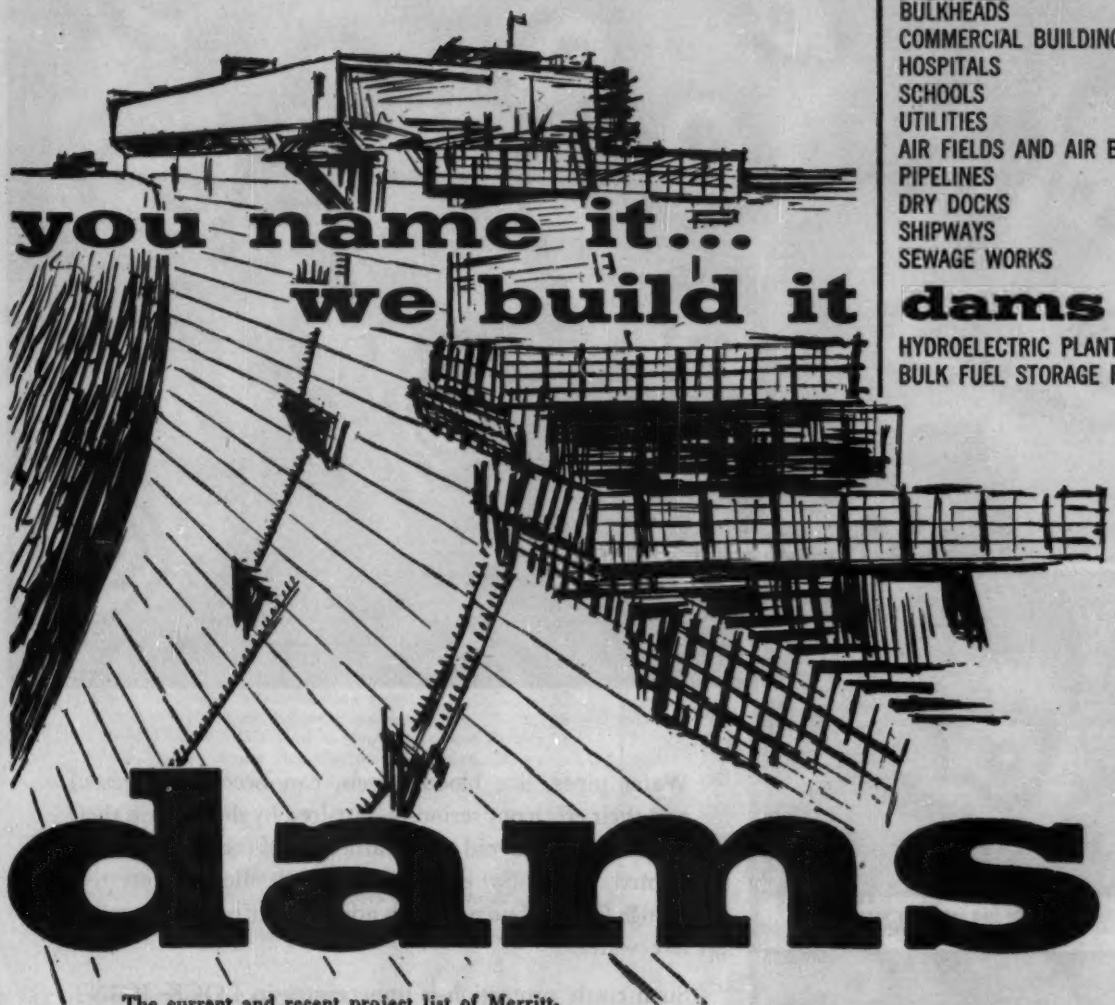

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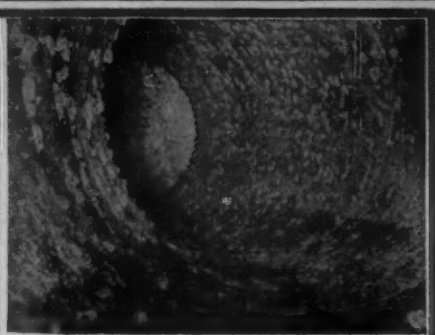

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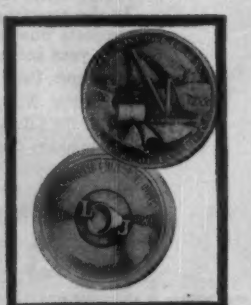

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THE CONSTRUCTION WEEK

HOUSING PROBED—Last Friday a congressional subcommittee on housing left New York for Philadelphia and the second step in an investigative tour of the nation. With them the peripatetic Congressmen carried in their minds and briefcases some recommendations that will affect new housing legislation as it is written next year. During the three-day hearings witnesses berated the F.H.A.'s languor and inflexibility in processing mortgage guarantees under Title 1; recommended increased federal aid to low and middle income projects; suggested aid for suburban and rural developments; and urged that the federal share for land acquisition under Title 1 be upped to 80% from the present two-thirds (page 21).

SEAWAY SICKNESS—A major contractor has defaulted on the St. Lawrence Seaway Project and—as pointed out in the story on page 23—with understandable cause. Aside from the basic reason for his failure, there remains the fact his bid was about 25% below the estimate. Yet another contractor was 50% under the estimate and so it goes. Add to these the power project contracts that have been let at prices negotiated below the low bids, and it's apparent that contractors have been eager—perhaps a bit too eager—to get in on what's shaping up as a really tough job.

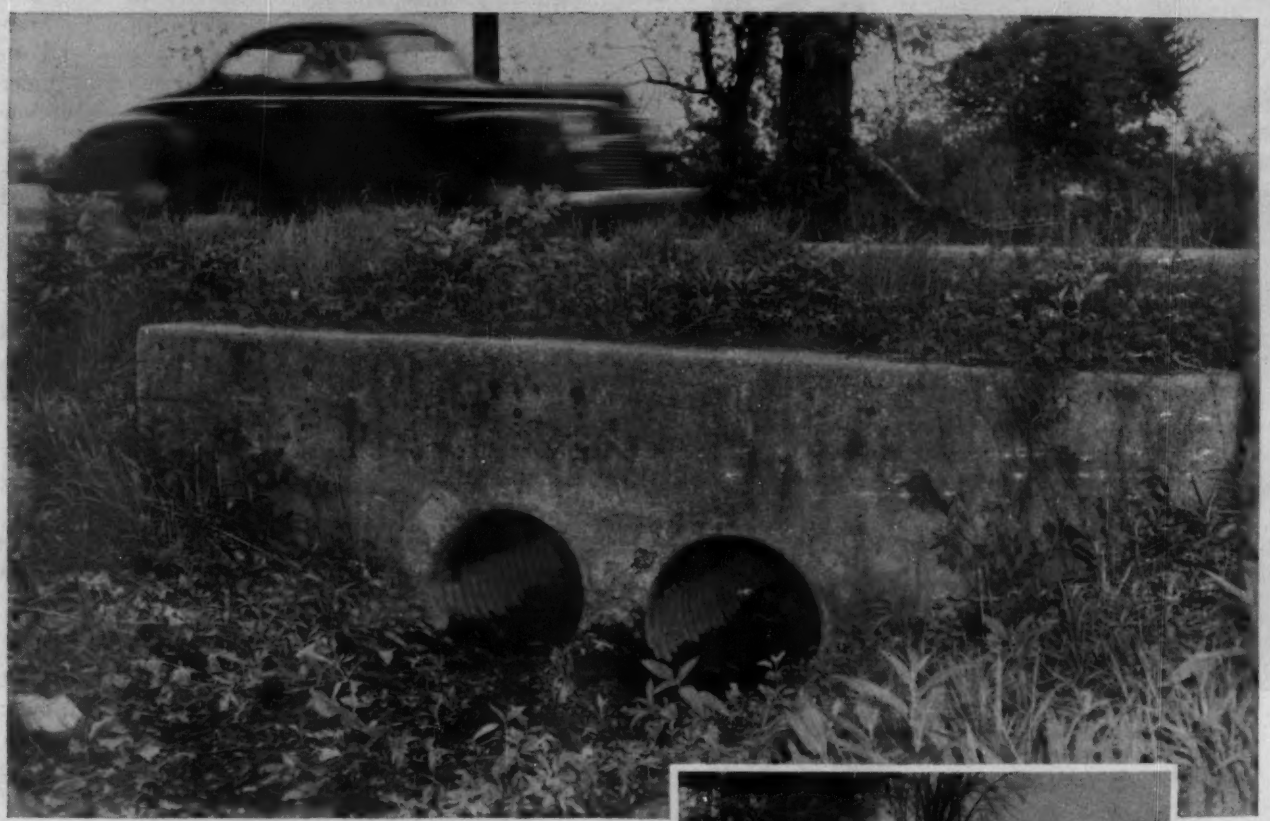
WHAT'S IN A WORD?—Last week the Connecticut State Highway Department ran into word trouble that could upset plans to use flexible pavement on parts of the Connecticut Turnpike. Bondholders have discovered that the bond declaration states that the turnpike would be built of "cement-concrete" and to them this doesn't mean asphaltic cement. However, other sections of the declaration make it clear that the design can be changed on approval from the consulting engineers. A Boston law firm will decide the issue (page 23).

LABOR SQUEEZE—It looks as if contractors are headed for an even tighter squeeze as the unions threaten to step up their organizational activities after the AFL-CIO merger becomes effective in December. Over $17 million in construction was thrown into a tailspin at Dover AFB in Maryland and a project in Ohio is faced with delay through new protests over the use of non-union labor (page 85).

HOW HIGH THE PENNANT—The Brooklyn Dodgers may play under a huge aluminum-framed plastic dome if experiments at Princeton succeed. If built it would be 300 ft high and 750 ft in diameter and would quite obviously preclude rained-out games. It might also make a nice spot to hang the "next year's" pennant.

How's this for culvert durability!

Twin Armco culverts withstand 48 years' service; 2 floods



This twin installation of Armco Corrugated Metal Pipe has been providing continuous service since 1907.

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Installation remained intact, even though road was washed out twice.

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WASHINGTON OBSERVER

Home builders and savings and loan officials teamed up for the first time to protest the administration's tightening of housing credit.

They say that screws have been turned down too far. They protest that housing—more than any other segment of the economy—has been singled out for especially stringent controls.

The two groups struck out at the Home Loan Bank Board for its clamp-down on loans to the savings and loans associations.

Actually, savings and loans officials say this cutback is small—that during the first half of 1955 45% of their loans were made from new savings, and 52% from repayments.

Thus only 3% of their lending has been affected by the HLBB's freeze on funds.

•

Despite strong reaction, government rulings won't be eased. Administration officials aren't going to reverse the tack they've taken, although they'll be keeping a close eye on housing starts, and economic trends in general.

The policy is to walk a tightrope to keep prosperity high without triggering either a new round of inflation or a touch of deflation—always with an eye to the elections next November.

Republicans will need all the political skill they can muster to win the White House next year—now that Eisenhower is being written off as the GOP candidate.

•

U. S.-Canadian split over Columbia River water is becoming sharper than any time heretofore.

Canadian plans for use of water on their side of the border include possibility of a huge diversion that might not ever cross the boundary. This would affect the flow through U. S. powerplants.

As much as 15-million acre-ft per year might be diverted to the Fraser River Basin which drains into the Pacific wholly within Canadian territory. Canadians would be diverting to increase their own power potential.

U. S. members of the International Joint Commission have objected to Canadian assurances that this could be done without injury to U. S. interest in Columbia water. The issue came to the surface at the semi-annual meeting of the I. J. C. in Ottawa last week.

Amount of water involved is substantial—it's equal, for instance, to total water parceled to the upper and lower basin states of the Colorado.

U. S. power plants affected by Canadian plans are vast—$1.5-billion of dams completed, another $1-billion under construction, and an estimated $2-billion more in the planning stage.

Issue can be settled quickly only if Canadians turn around on their claimed rights to divert the water involved.

Otherwise, the situation will be a source of irritation between U. S. and Canada for years to come.

•

Building trades leaders are still worried about AFL-CIO merger. They've been meeting together, mostly to talk over problem with CIO's Steelworkers. Craft unions want to be sure that steelworkers won't do new construction work in industrial plants. CIO has promised this, but building trades people still sorry that it won't stick once merger is a fact.

•

Left-wing Mine-Mill and Smelter Workers Union has talked to AFL laborers about becoming affiliated—but got the cold shoulder. Mine-Mill wants in to AFL to halt government crackdown on its leaders for Communist ties. It argued that both unions "work on hard rock."

Announcing the Zephyrcranes

A NEW complete line of advanced-design Truck-Cranes

The new Link-Belt Speeder line of truck-mounted Zephyrcranes features Speed-o-Matic — the true power-hydraulic control system. Fingertip-operated, it provides fast, easy, positive response, perfect "feel" for speed with accuracy. And because it greatly reduces operator fatigue, keeps him alert . . . you increase safety, and your operator is able to maintain greater output with less effort.

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- **REVERSING CLUTCHES** are available for either or both main drums . . . provide power load lowering of main hoist line and jib whip line.
- **THIRD DRUM** available for HC-88, 98, 108 is particularly valuable for piledriving applications.
- **ALL CLUTCHES ARE INTERCHANGEABLE** (within each model) with exception of front drum reversing clutch on the HC-58 and HC-68.
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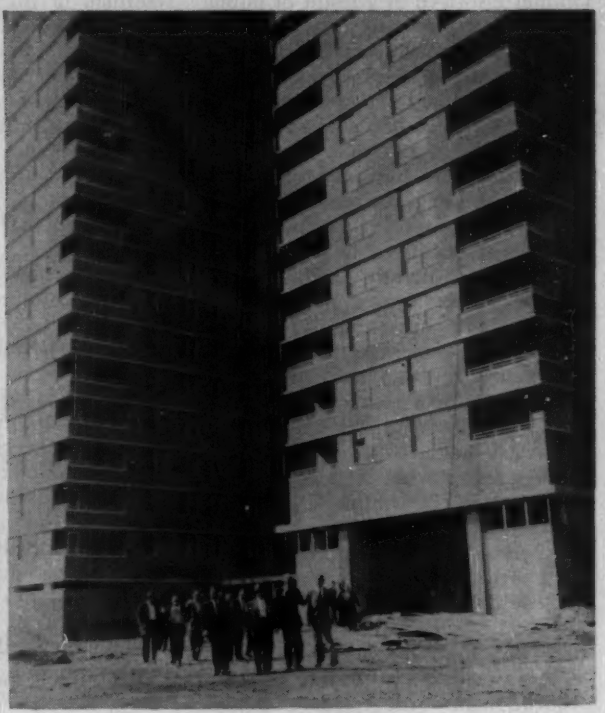
OCTOBER 13, 1955 ENGINEERING NEWS-RECORD

What's Wrong Here . . .

Wide World photo

\$75 a room for this . . .



. . . \$17 a room for this

House Group Probes Lag in Public Housing

Barbara Lamb
Staff Writer

Last week eight Congressional probers got their first grass-roots answers to the question of what is holding up public housing and urban redevelopment and renewal programs.

The answers came in New York City—starting point for a series of cross-country hearings scheduled by the housing subcommittee of the House Committee on Banking and Currency. The investigators, headed by Rep. Albert Rains (Dem.-Ala.), have a ticklish task. Federal housing laws expire next year. Before new legislation is written the committee wants to take stock of nation-wide housing accomplishments and shortcomings.

New York City, with its skyscraper slums, proved to be a fertile field for the Congressmen. A tour of slum spots and housing projects impressed them with what has been done—and with what remains to be done.

No one expected the three-day hearings to turn up an overnight solution for removing stoppers to the building bottleneck. But witnesses—experts in the field of housing—voiced a lot of basic criticism as well as suggestions for improvements.

One of the best pieces of news to emerge from the hearings was Mayor Robert F. Wagner's announcement of a multi-million dollar plan to rehabilitate a vast section of the west side of Manhattan. This area is presently a hodgepodge of luxurious residences and crumbling structures. The plan would team up federal low-income, city middle-income, state cooperative and private enterprise to concentrate rehabilitation in one Manhattan section.

Good housing in the area would be preserved. Buildings warranting it would be rehabilitated. Obsolete housing would be torn down and replaced with low-income and middle-income projects.

The City Housing Authority will ask the Federal Public Housing Administration to put the city's entire 1955-1956 allocation of Federally-subsidized, low-rent housing—some 8,000 units—into that area. It also will ask the Board of Estimate to focus the bulk, if not all, of the city's 1955-1956 available credit for middle-income, non-subsidized housing in the same locale.

"The first step," Mayor Wagner told the Congressmen, "will be to have the City Planning Commission designate the section as an urban renewal area within the meaning of the 1954 Federal Housing Act. This would make private capital eligible for substantial Federal mortgage financing."

This proposal showed the Congressional investigators that wheels are turning in the right direction. But much of the rest of the hearings emphasized that Federal loopholes still have to be plugged up before New York—and other parts of the country—can hope to make a sizeable dent in housing needs.

Recommendations

What action will be taken by Congress is guesswork. But one thing is certain: The touring probers will take back a briefcase full of recommendations to Washington. These include:

• Increase Federal aid to low-in-

. . . Probe Lag in Public Housing

come projects to house families whose homes are taken for slum clearance or highway projects. And make provision for middle income housing to aid families displaced as a result of public projects.

- Change present methods of operation so housing aids are not concentrated in or close to large metropolitan areas and in certain types of residences.
- Expand the Housing Act to provide for building (1) small groups of individual houses on a number of smaller sites scattered throughout the community; (2) very small projects with a higher degree of self-maintenance and operation; (3) apartments for large-size families; (4) apartments for one and two-person families; (5) apartments for the aged and physically handicapped.
- Relax Federal credit controls on housing to prevent a slackening of home construction during 1956.
- Make Federal funds for neighborhood rehabilitation planning available in suburban areas to a central planning authority.
- Revise the present formula so that the Federal government pays 80% instead of two-thirds of land acquisition for Title 1 redevelopment projects.
- Increase the inventory of housing on a broad national scale.
- See that the Federal Housing Administration expedites mortgage guarantees to Title 1 projects that are now stymied and hastens approval of additional Title 1 projects for which advanced studies have been authorized.
- Provide regional offices of Federal housing agencies with a larger and better paid staff to handle the expected flow of applications for financing aids. And give these officers greater stature.
- Fix by law the responsibilities of the Housing and Home Finance Agency administrator so that he is not just a nominal head.

Roadblocks

Testimony at the hearings laid much of the blame for hamstrung housing in the lap of the Federal Housing Administration. Many experts seem to believe that FHA policies and procedures rather than defects in the National Housing Act have brought rental and cooperative housing programs to a standstill.

"New York City's slum clearance program has been delayed by timidity and indecision in the FHA over making commitments for mortgage insurance on Title I projects." This is the opinion of City Construction Coordinator Robert Moses, testifying as chairman of the Mayor's Committee on Slum Clearance.

"Since 'windfall' investigations there has been a virtual cessation of rental housing under Section 207 and cooperative housing under Section 213." This is the viewpoint of J. Clarence Davies, Jr., president of the Citizens' Housing and Planning Council of New York. He declared that endless FHA delays have accounted for failure to get under way the Section 220 program relating to insurance of construction in urban renewal areas.

"The New York regional FHA office serves no useful purpose because it declines to make any decisions or accept responsibility for decisions without double-checking with the Washington home office." This was in the report of Joseph H. McMurray, New York State Commissioner of Housing.

He also told the Congressmen that certain "unreasonable" regulations still are being "slavishly" applied by FHA. "A good deal of this is the result of Washington's failure to take into account variations in regional requirements for sound construction and management."

McMurray cited examples of what he termed unreasonable regulations: Rigid rules on room sizes; unrealistic valuation of land; inadequate allowances for overhead, profit and architectural fees; insufficient consideration to local differences in determination of costs and rents; restrictive obstacles in the path of flexible design and planning.

But the hearings also brought out the other side of the picture. Federal aides declared that in cases where U.S. housing agencies have moved slowly it had been because the city had not taken necessary action—because the builder-sponsors changed plans or failed to meet requirements.

The major voice of FHA was William A. Schulz, director of the agency's New York field office. "Delay—if any—in processing mortgage insurance applications has not been the result of any dilatory action on the part of FHA. The urban renewal and redevelopment program is a difficult and necessarily complex one to administer. It involves separate considerations by municipal authorities, Urban Renewal Administration, FHA, builder-sponsor, and lending institutions. All of these must be coordinated."

Schulz told the congressmen that any delay in reaching commitment stage stems from one fundamental problem: The builder-sponsors' desire to obtain maximum favorable terms. "They want excessive land valuations, minimum mortgage amortization payments, excessively long-term mortgages, minimum cash investments, builders profits above what has been determined to be fair and equitable, and quick recovery of investment."

Whatever the reason, until a couple of weeks ago not one privately developed slum-clearance job had been started in the U.S. with Federal mortgage commitments under Title 1.

The first sign of a break in this log-jam came on Sept. 29 when FHA Administrator Albert M. Cole signed almost $6.5 million in mortgage commitments to let private builders get going on the Delano Village program in New York City's North Harlem.

Charles Axelrod, who will carry out the Harlem job, cited his case to the Congressional investigators as an example of snarls that face builders under FHA.

Five years elapsed between the time he initiated the project and the time he received FHA's commitment. During this period he had to scrap thousands of dollars worth of plans while trying to get financing under Sections 207, 213 and—finally 220. During this time he tied up a substantial amount of cash in the project.

Relocation

Axelrod had other problems on his hands. One was relocating 1,200 tenants inherited along with the site title in 1952. Another was operation and management of existing structures earmarked for demoltion.

Relocation is one of the most difficult, complicated and controversial aspects of New York's housing problem.

New York is the only U. S. city that doesn't raze slum buildings and relocate occupants before turning the land over to private builders. Its method of making the builder-sponsor responsible for rehousing tenants and clearing land was blamed by witnesses for causing delay, limiting the number of builders, and creating difficulty in determining land value.

One thing would seem certain. If the Congressional committee learns as much in the other cities it investigates as was forthcoming in New York, it will be well equipped to give the housing laws and regulations the kind of analytical going over that has been demanded ever since the windfall profits cases came to light. And, it is conceivable that the right kind of new housing legislation may be in the making before the committee completes its travels.

Contract Default

Soil proves too much for scrapers; firm gives up on Seaway excavation job

Jack and Jim Maser, Inc., of Brownstown, Pa., has had the unfortunate distinction of being the first major contractor to default on construction of the St. Lawrence Seaway project. The Tecon Corp. of Dallas, Tex. has been assigned to complete the work.

The Maser firm has been working on, and had about half finished, excavation for Robinson Bay Lock in the 10-mi Long Sault Canal near Massena, N. Y. It had taken the 2,604,000-cu yd job on a $991,000 low bid, $386,000 under the Corps of Engineers' estimate.

Maser undertook the job of excavating 120 ft down through heavy, boulder-strewn glacial till as a scraper operation. And when ENR visited the St. Lawrence project recently (for a coming feature article) the handwriting was plainly on the wall; the word everywhere in the area was that Maser should have used shovels. The heavy (140 lb per cu ft) glacial till was taking its toll on the scraping equipment. Whereas the firm had bid about 34 cents per cubic yard for exacavation, it was reportedly claiming an actual cost of 54 cents per yard.

There was a January completion date on this excavation project. Jack and Jim Maser, Inc., informed the St. Lawrence Seaway Corp. that it did not "have the funds with which to defray the cost of further construction operation."

The Buffalo District, Corps of Engineers, called in a few firms—received bids from at least four—and wound up with a contract to the Tecon Corp. This firm is already in the project area as builder and operator of the aggregate plant which will supply all sand and stone to the St. Lawrence power project, under contract with the Power Authority of the State of New York.

Tecon took over the Maser work last Friday and will run it as a shovel and dragline operation.

Under the newly negotiated contract, Robinson Bay Lock excavation will total $1,063,095. The bonding company for the defaulted contractor is to pay the difference between this cost and the original low bid. A new deadline of March 1 has been set for completion of the excavation.

Jack and Jim Maser, Inc., was not the only contractor having its troubles moving the heavy glacial till of the area. This soil is like glue when wet and weighs "like gold" dry.

Bay Bridge Bids

Four contracts to be let on $46-million parallel Carquinez Straits Bridge

The California Toll Bridge Authority was scheduled to advertise bids this week on the first of two bridges to be built across Carquinez Straits between San Pablo and Suisun Bays, arms of San Francisco Bay.

The bids are being asked on four contracts covering about 90% of the work on a new crossing which will parallel at a distance of 200 ft the present Carquinez Bridge, just south of Vallejo. Immediate issuance of $46 million in revenue bonds was approved by the authority this week to finance construction of the bridge and a southern approach (ENR June 16, p. 23; Aug. 18, p. 24).

A year from now the authority will issue $34 million in bonds to finance building of a $26-million Benicia-Martinez crossing at the entrance to Suisun Bay, and two other projects: improvements to the existing Carquinez Bridge and a freeway approach through Vallejo to the twin span.

First of the four bid openings on the new Carquinez crossing will be Nov. 28 for construction of the southern highway approach. This contract will require 11,000,000 cu yd of excavation, making the job one of the largest highway cuts ever made.

Bids for the substructure are due to be opened Nov. 29 and on the superstructure Nov. 30. On Dec. 1 bids will be opened for construction of approach spans and interchange ramps. The four contracts are scheduled for completion in Aug. 1958.

The cantilever bridge will have two 1,100-ft main spans and two 500-ft side spans.

Concrete vs Asphalt

Bondholders question plan to take alternate bids on the Connecticut Turnpike

Plans of the Connecticut Highway Department to use bituminous paving on parts of the Connecticut Turnpike (ENR, Sept. 29, p. 71) have been held up by the threat of legal action by bondholders. Bondholders have discovered that the bond declaration says that the turnpike would be "built with cement-concrete."

As a result of this threat, Highway Commissioner Newman E. Argraves has held up award of a contract for paving the Milford link, on which alternate bids were received Sept. 26. He also has asked the state's bond counsel to rule on whether award of a contract for bituminous concrete would be legal. In so doing, Argraves noted that the bond declaration also provides that the design can be changed if the consulting engineers certify that the change would be satisfactory.

To bring the matter to a decision, Argraves stated that he had filed with the trustees "my approval of the modification in design, and a certificate from the engineering firm of Ammann & Whitney that this alternate flexible-pavement design is satisfactory and that construction cost will not exceed that of portland-cement reinforced-concrete pavement design."

Argraves also said that he has a certificate from the firm of Coverdale & Colpitts saying that the use of flexible type pavement will not adversely effect the volume or character of traffic nor the toll revenue.

Apparent low bidder on the bituminous concrete pavement was L. G. DeFelice Son, New Haven, with a bid of $4,728,527. Second low was Savin Construction Corp., East Hartford, at $4,783,594.

Savin was low in the portland-cement concrete paving with a bid of $5,006,411. Second low was DeFelice at $5,099,736.

Unfinished School Projects Bring $100-a-Day Penalties

Salt Lake City's Board of Education—irritated at delays in construction and renovation of schools—is enforcing contract penalty clauses against builders.

Contractors are subject to pay $100 for each day their projects run past the contract completion date. Twelve school projects already have been affected by the board's decision to invoke this penalty clause.

APWA Starts Research Plan

A new dimension was added to the services of the American Public Works Association last week when it adopted procedures under which it will sponsor research on critical municipal problems.

The APWA's 61st annual convention in Milwaukee was the occasion for the first official meeting of the board that will administer the research grants. It was disclosed that funds would be sought from such organizations as the Ford Foundation and from manufacturers in the public works field. And, it was announced that 50% of city membership service fees would be earmarked for the project.

A modest start on the program already has been made, with a small contribution to a national committee on urban transportation, sponsored by six organizations, and another to help defray cost of updating a refuse collection practice book and the preparation of a book on disposal practices.

What APWA hopes to do is to obtain grants, which it would then use to support research projects at universities and other agencies, and then disseminate the findings through its regular channels to public works officials.

APWA had a record attendance at this year's convention, which afforded discussion of a wide range of public works administration topics, and featured an equipment show that listed 70 exhibitors, others having had to be turned away for lack of space.

Air pollution was given a top billing this year. Dr. Louis C. McCabe, Director of the Division of Sanitary Engineering Services, U. S. Public Health Service, had a capacity audience as he explained the provisions of Public Law 159, passed by the last session of Congress to provide funds for a stepped up program of research into the causes of air pollution.

Dr. McCabe noted that Public Law 159 made available $1,190,000 this fiscal year, in addition to $595,000 already included in the regular budget of the Public Health Service for air pollution investigations. He explained that the additional funds voted by Congress were being doled out to a variety of agencies, which would be able to study the problems from many angles, including the Weather Bureau, the Taft Sanitary Center, the Bureau of Mines and a number of universities.

Out of the sessions devoted to discussion of a wide range of public works administration matters came these salient points, which public works officers passed along to their colleagues:

• **Procurement**—Chicago, explained its Deputy Purchasing Agent, Richard B. Berry, is making notable progress in developing criteria for equipment specifications that involve a very thorough evaluation of such factors as durability, productivity and others that make for low-cost operation—in other words getting away from the tendency to make low purchase price the big factor in purchasing decisions.

• **Contracts**—Detroit's City Engineer, Milton F. Wagnitz, counseled his colleagues that they ought to take a closer look at preparation of contract documents in the interest of eliminating outmoded provisions and clearing up ambiguities that hamper bidders.

There's too much timidity on the part of public works officials about rejecting low bidders in the interest of getting better qualified ones, Henry D. Harral, Street Commissioner for Philadelphia, declared in a paper on "Award Procedures". He explained Philadelphia's practice of prequalifying bidders.

• **Insurance**—Orville C. Peterson, attorney for the League of Minnesota Municipalities, called attention to the fact that some state legislatures had authorized city governments to carry insurance against liability for damages to private property resulting from defective facilities or services and for compensation to city workers for injuries suffered on the job. He predicted that such legislation would gain new adherents rapidly in the next few years.

• **Sub-surface utilities**—L. P. Staman, director of public works for Tacoma, Wash., underscored the need for better planning and coordination to cut down the heavy expense of repeatedly tearing up streets to accommodate sub-surface installations necessary for utilities.

First Fellowship Winner Sees the Evidence

Twenty-three year old Melvin Jack Shelly of Vancouver, B. C., who won the first Engineering News-Record Fellowship for graduate study in the field of public works engineering and administration, is shown his certificate by Allan H. Rogers, Superintendent of Public Works for Garden City, N. Y. and chairman of the APWA Board of Awards.

Other members of the board are Jesse B. Gilkerson, City Engineer, Long Beach, Calif., and Stanley Palmer, City Engineer, Kansas City, Mo.

Shelley received his B.S. degree in civil engineering last June from the University of British Columbia and will return to the same school to work for his Master's degree under the fellowship. The award was made on the basis of a rating system that takes into account scholastic capacity, demonstrated ability on a public works job, personal qualities and the relative excellence of a paper written about the public works job.

Shelley, who worked during the summers as assistant to F. G. DeWolf, City Engineer of Vernon, N. C., wrote his paper on the design and operation characteristics of that city's sewage treatment plant, and plans to return to Vernon's city engineering department when he completes his graduate studies.

New Ohio Crossing

Kentucky, Indiana agree on plans for toll bridge

An agreement on financing and construction of a $12-million Ohio River toll bridge between Louisville, Ky., and New Albany, Ind., has been reached by governors of the two states.

The pact calls for Indiana's Highway Department and Toll Bridge Commission to design, build, maintain and operate the bridge. Kentucky will contribute the right-of-way over the Ohio and build approach roads for the bridge on its side of the river.

Under the agreement, Indiana has the federal money available, but the project must be approved before funds can be released. The rest of the construction cost would come from the Indiana Toll Bridge Commission. Most of this will be raised by a revenue bond issue to be paid off from tolls.

Location of the bridge must be pinpointed before application can be made for federal aid. Coverdale & Colpitts, New York City engineering firm, has reiterated its 1952 recommendation that the bridge be located adjacent to and parallel to the existing, privately-owned Kentucky and Indiana bridge.

The bridge has been a controversial subject (ENR Sept. 8, p. 24). Four new Ohio River bridges were recommended by Harland Bartholomew & Associates, St. Louis planning firm, as part of a program to solve Louisville's traffic problems. The Louisville Bridge Commission planned to build the New Albany crossing first. The planning firm, however, gave top priority to a bridge to Jeffersonville.

New Orleans Bridge

Fourth contract awarded on Mississippi crossing

Bethlehem Steel Corp. has been awarded a $12.2 million contract for constructing and supplying materials for the superstructure of the new Mississippi River bridge at New Orleans.

The bid, one of three received by the Mississippi River Bridge Authority, was some $1 million below the $13.3-million estimate prepared by Modjeski & Masters, consulting engineers. American Steel Bridge Division of U. S. Steel Corp., Pittsburgh, submitted a bid of $12.9 million, and Judson-Pacific-Murphy-Kiewit of Emeryville, Calif., submitted one for $15.4 million.

The superstructure work is to be completed within 820 days after the contract is signed. Since the bridge authority already is six months ahead of schedule, the span is expected to be open for traffic by Jan. 1, 1958.

The contract for the superstructure will be the fourth awarded by the authority.

Virginia Tunnel Proposal Up for Traffic Survey

A traffic study to determine the economic feasibility of a second tunnel under the Elizabeth River between the Virginia cities of Norfolk and Portsmouth will be made by DeLeuw, Cather and Co. of Chicago.

The Elizabeth River Tunnel commission, which operates the present bridge-tunnel connection between the two cities, has already had a favorable engineering report on the proposed second crossing. The new tunnel would be located a little over a mile downstream from the present facility.

The traffic study will take in many parts of the Hampton Roads area. One of its objectives will be to determine the effect on present tunnel traffic of the Aug. 31 closing of the Portsmouth-Norfolk County ferries, and the scheduled opening in the fall of 1957 of the Hampton Roads bridge-tunnel between Hampton Roads and Norfolk.

Gen. Fleming Dead

Army Engineer held key posts in federal agencies

Maj. Gen. Philip B. Fleming, Army engineer and public servant, died last week at the age of 67.

In 1935-36, he took charge of the Passamaquoddy Bay project while in the Public Works Administration. Then a colonel, he moved on to direct the construction activities of the Resettlement Administration.

Shortly thereafter he returned to the Regular Army as district engineer at St. Paul where he worked on improvements in the upper Mississippi region. In late 1939 he returned to Washington to serve in the Labor Department.

He was appointed by President Roosevelt to head the Federal Works Agency where he directed relief measures for hurricane victims in Florida in 1947, for the Maine fire disasters of the following year and for recurrent floods in the Midwest and Northwest. He held this post until 1949.

Among the general's decorations was the Distinguished Service Medal awarded by President Truman for his long record of public achievement.

Old Oil Tank Gets New Look, New Job

Continental Oil Co.'s scientists and engineers combined their talents to convert an unused oil tank into an attractive research pilot plant at Ponca City, Okla. Faced with corrugated aluminum and porcelain enameled panels, the 80,000-bbl tank features glass doors, a canopied main entrance and a separate entrance for trucks. The 60-ft-dia interior houses a number of kettles for test runs on new products and a ceiling-suspended revolving crane for charging. Ventilation is supplied by a central dome on top. Surrounding the pilot area are three floors of air-conditioned laboratories and offices with 30,000 sq ft of floor space.

City to Spend Big

$100 million in capital improvements next year

The City of Brotherly Love will be a friendly spot for contractors next year when Philadelphia is scheduled to spend $100,410,833 on capital improvements. Nearly half the money will be spent on roads, streets and bridges, with the remainder going to improvements in water and sewage works, port and airport facilities.

The city will pay $60,725,626 of the costs, another $30,795,491 will be borne by the state and $3,989,921 will be federal funds. Railroads will spend $1,070,000 for replacement and repair of bridges over their tracks and $3,829,795 will be collected in the form of assessments for paving, water meters, etc. Approximately $42 million of the city's share will come up for approval by the electorate next month—advanced by both major political parties, passage of the amount seems assured.

The big spending for streets and highways is destined to go primarily for the construction and revamping of feeder routes for three major projects around the city—the Walt Whitman Bridge over the Delaware River to Gloucester, N. J.; the Schuylkill Expressway which, when completed, will connect the midtown sections of the city with the Pennsylvania Turnpike; and the proposed Delaware Expressway which, if built, would extend northward along the river to connect with the New Jersey-Pennsylvania Turnpike extension. Total expenditure for the feeders and other improvements are expected to amount to $47,066,500.

The sum of $13,500,000 has been earmarked for water works improvement, lines and mains. With this expenditure the city will be nearing the end of an extensive rehabilitation scheme started in 1940. By the end of 1956, $40 million of a planned $50 million will have been spent.

Sewage collection and treatment facilities are due for a $8-million improvement and another $145 million is to be spent on sewers and drainage projects. In this respect too, Philadelphia is nearing the end of a long-term project which will have spent more than $80 million in the last ten years. Remaining to be completed are the western and eastern sections of the lower Schuylkill plant.

Improvements on port and airport facilities will be mostly of a minor nature with $4 million to be spent. Recreation facilities account for another $2.8 million.

At the same time, a five-year plan was submitted calling for expenditures of $571,128,961 by 1961. Streets, highways and bridges during that period would require $309.5 million, sewers and drainage facilities, $655 million; and water works improvements, $50 million. Less than $20 million will be spent on sewage collection and treatment facilities because of previous expenditures. The remainder of the fund is intended to be used for health and welfare facilities, and for the construction of other city services.

Turnpike Safety

'Creeper lanes' for trucks latest Pennsylvania plan

Two "creeper lanes", one of eight miles and the other of six, will be built to take care of slow-moving truck traffic on two mountainous stretches on the western part of the Pennsylvania Turnpike.

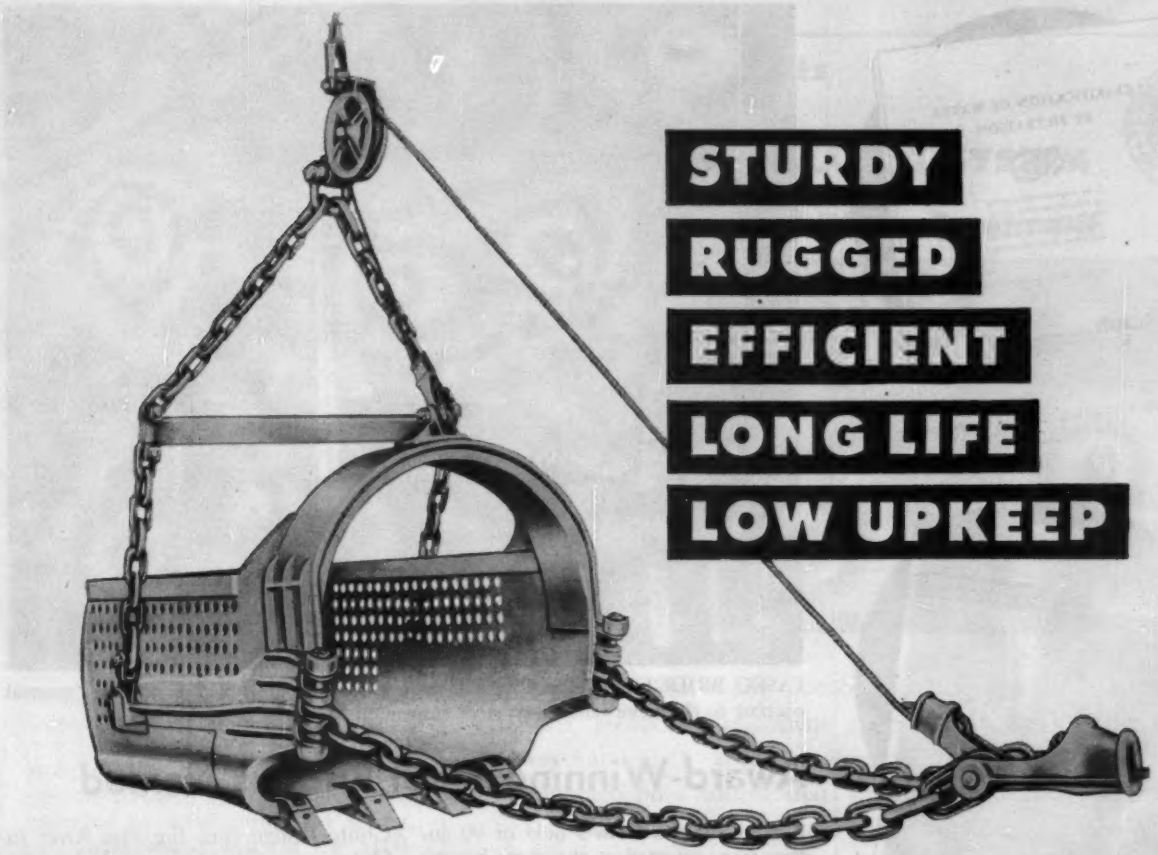
One lane will parallel the turnpike for eight miles to the Allegheny Tunnel in an easterly direction and the other for six miles to the Laurel Hill Tunnel going west. The Pennsylvania Turnpike Commission has the projects in the planning stage. Construction is scheduled for next year.

Meanwhile, the commission has successfully opposed efforts that have been made in the state legislature to force construction of a median barrier on the turnpike and other main highways. Franklin McSorley, commission chairman, has told legislators that a median barrier would cost $25,000 a mile. He estimated total cost on all the state's toll road mileage, including the 110-mile northeastern extension now under construction, at close to $12 million.

The commission introduced statistics showing that only 8% of all turnpike accidents resulted from cars hitting or crossing over the median strip. Commissioner David Watson told legislators the commission feels a barrier would tend to increase the number of rear end collisions. He said rear end collisions account for 30% to 35% of all turnpike accidents —a figure the projected creeper lanes are designed to reduce.

How to Get a New Span—the Wrong Way

Seconds after this picture was taken the crumpled leaf of this bascule bridge over the Ashley River on the Ocean Highway at Charleston, S. C., toppled into the water. Total damage has not yet been estimated, but in addition to the loss of the steelwork, large cracks appeared in the piers. State Highway officials said it would require two to three weeks before temporary repairs can be completed; a ferry service will be instituted in the mean time. One alternative is that work may be speeded on a new span 10 mi north of where the collision occurred. The culprit—a creosote-laden tanker which struck the not fully-opened bascule—escaped with a dented smokestack and damages to its bridge.



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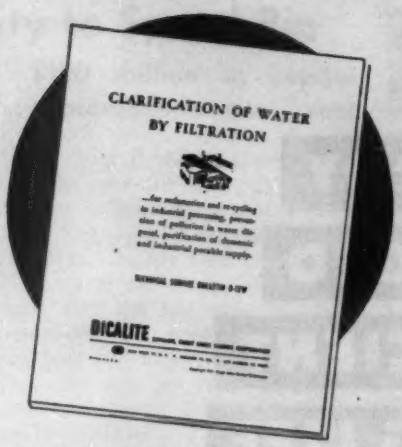

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PASEO BRIDGE in Kansas City is Class I winner. It was noted as offering "unusual contrast to the more familiar types of suspension bridge."

Award-Winning Steel Bridges Named

Nine bridges from a field of 90 entries were selected as the most beautiful steel bridges in the U.S. The competition, which is sponsored by the American Institute of Steel Construction, was restricted to bridges opened to traffic in 1954.

Ordinarily, four classes of awards are made each year—Class I for bridges with spans over 400 ft, Class II for those with spans under 400 ft but costing more than $500,000, Class III for bridges with spans under 400 ft and costing less than $500,000, and Class IV for movable bridges. Awards in the last classification were withheld this year.

Winner in Class I was the Paseo Bridge across the Missouri River between North Kansas City and Kansas City, Mo. Owners of the bridge are Jackson and Clay Counties, Mo.; it was designed by Howard, Needles, Tammen & Bergendoff and fabricated by the American Bridge Division of U.S. Steel Corp.

A stainless steel plaque is to be awarded to the winner and honorable mention certificates will go to two other bridges in this class; both are on the West Virginia Turnpike and are owned by the Turnpike Commission. One, the Stanley Bender Bridge is at Standard; the other, the Cornelius H. Charlton Bridge, is at Camp Creek. Both were designed by Howard, Needles, Tammen & Bergendoff and fabricated by American Bridge.

Class II winner was the Little Chute Bridge over the Fox River in Outagamie County owned by the State of Wisconsin. Designer was the State Highway Commission and the fabricator was Bethlehem Steel Co. Honorable mention went to the Raritan River Bridge owned by the New Jersey Highway Authority. This bridge, which is on the Garden State Parkway at Perth Amboy, was designed by D. B. Steinman and fabricated by Bethlehem Steel. A second honorable mention goes to the Walkill River Bridge at Rosendale, N. Y. This bridge is owned by the New York State Thruway Authority and was designed by the state's Department of Public Works assisted by Edwards, Kelsey & Beck. Fabricator was the Phoenix Bridge Co.

Another Kansas City bridge won in the Class III competition—Garrison School Pedestrian Bridge. Owners and designers are the same as those named for the Paseo Bridge; fabricator was the Kansas City Structural Steel Co. Honorable mention for this class went to the Indian Creek Bridge in Plumas County, Calif. and the Cowhide Branch Bridge at Anapolis, Md. The former is owned by the State of California and was designed by the Bridge Division of the Highway Department. Moore Drydock Co. was the fabricator. The latter bridge is owned by the Maryland Roads Commission and was designed by the J. E. Greiner Co. with the Bethlehem Steel Co. being the fabricator.

First Contract Is Awarded On Ft. Gaines Lock and Dam

The Corps of Engineers, Mobile, Ala. District has awarded the initial contract for work on the $86-million Ft. Gaines Lock and Dam project in Georgia.

Moss Construction Co. of Columbus, Ga., got the contract for $933,000. Work involves construction of a non-overflow earth dike on the west embankment of Chattahoochee River in Henry County, Ala.

Congress already has appropriated $1.8 million for start of work on the lock and dam. The project will play an important part in development of the Apalachicola, Chattahoochee and Flint River system in Georgia, Alabama and Florida.

Lincoln Tunnel's New Tube Pushes Across State Line

With 1,105 of its more than 2,000 tunnel rings put in place, the third tube of the Lincoln Tunnel has now crossed the N. Y.-N. J. state line. Yet to go is a 2,400-ft section that will link the completed western and eastern sections; the hole-through is expected to occur early next spring.

Ground was broken for the $100-million facility on Sept. 25, 1952, and construction of the 5,486-ft under-river section began last Nov. 9. The two-lane, under-river roadway is being assembled, ring by ring, by 200 sand hogs working behind a shield that cuts through the river bottom muck in 32-in. shoves.

Forty-one contracts totaling over $62 million have been awarded to date. Completion is expected early in 1957.

Bids on Tunnel Facilities Called at Hampton Roads

Virginia's Department of Highways has called for bids on nearly all work remaining on the water-crossing portion of the $58.5-million Hampton Roads Bridge-Tunnel.

Bids will be received on Nov. 16 for the following projects: depressed ramps leading to the tunnel on the north and south portal islands; ventilating buildings; equipment and machinery; a crash truck garage on each island; electrical and mechanical equipment, and metal railing and roadway lighting on 9,400 ft of approach bridges.

The $19-million contract for construction of the tunnel was awarded last fall to Merritt-Chapman & Scott Corp. (ENR Sept. 15, p. 30).

Jobs still to be advertised include tile work and roadway paving in the tunnel as well as 22 mi of approach highways and connecting roads.

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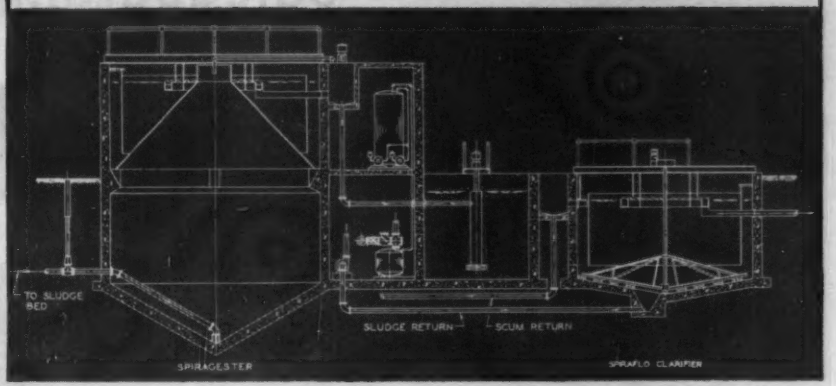

One of the many possible arrangements is illustrated. The secondary treatment is provided by the Cavitator mechanism, a specially designed rotor with two arms mounted on a hollow shaft through which air is drawn for dispersion through the tank contents. The arms are streamlined with the outer ends so constructed that when they are passed through the liquid at relatively high speeds they create a zone of cavitation through which the liquid is recirculated continuously. Air and liquid are drawn together creating a vapor pressure condition corresponding to cavitation with its tremendous forces. The oxygen is forced into the sewage and creates countless small air bubbles which permeate the entire liquid body.

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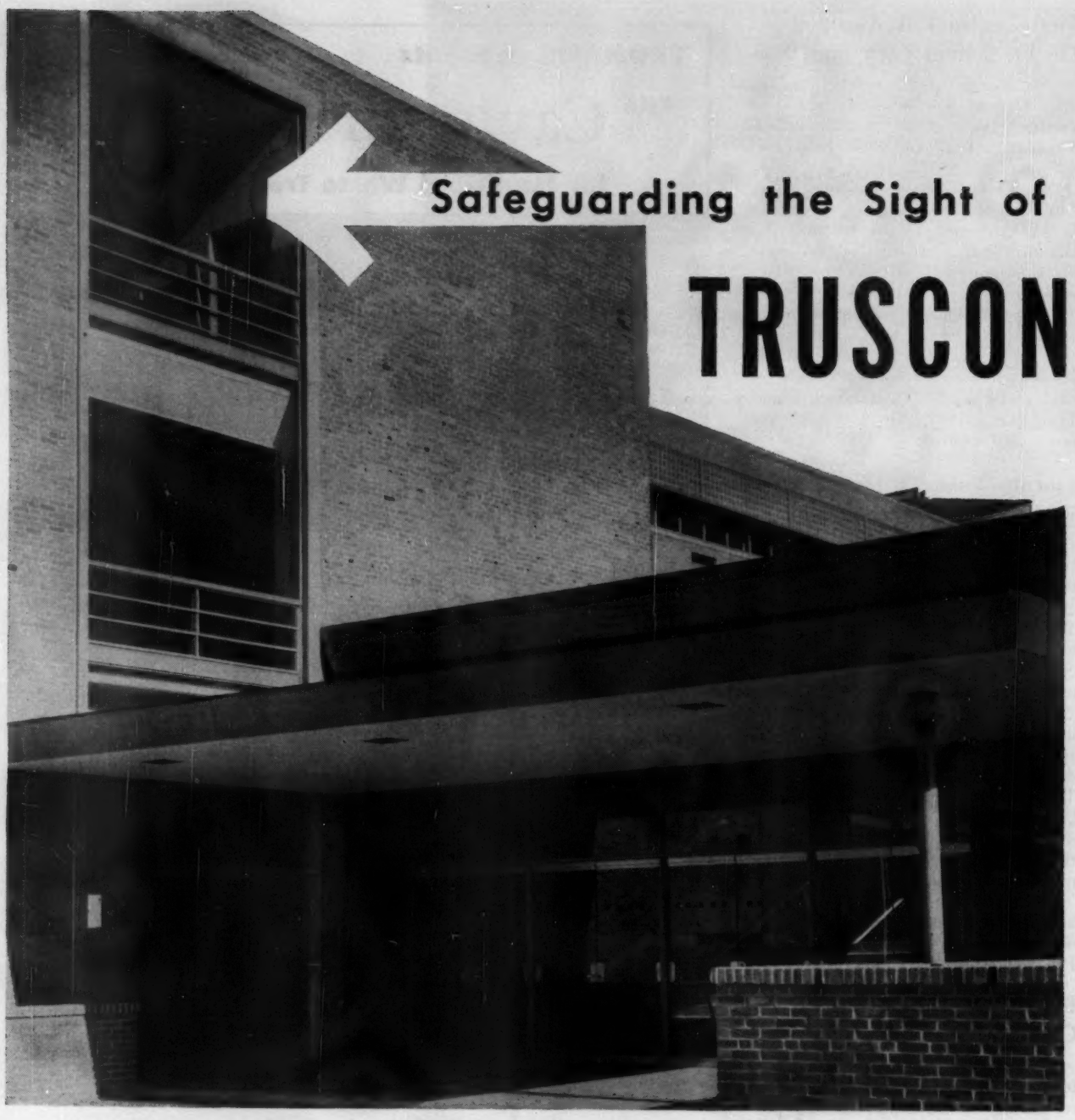

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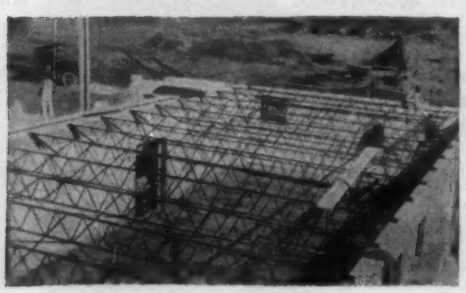

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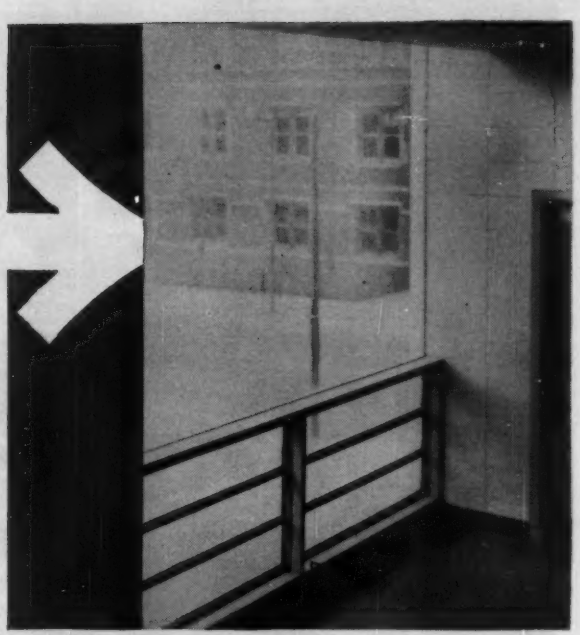
Tomorrow's Physicists

Steel Windows

in University of Pennsylvania Physics Lab, Philadelphia, Pa.



UNIVERSITY OF PENNSYLVANIA PHYSICS LAB., Philadelphia, Pa.
ARCHITECTS: Jas. R. Edmonds, Jr., Baltimore, Md. and Willing, Sims & Talbutt, Philadelphia, Pa.
GENERAL CONTRACTOR: The Baton Construction Corp.
TRUSCON WINDOWS USED: Donovan, Architectural Projected, Commercial Projected, and Maxim-Air Steel Windows.

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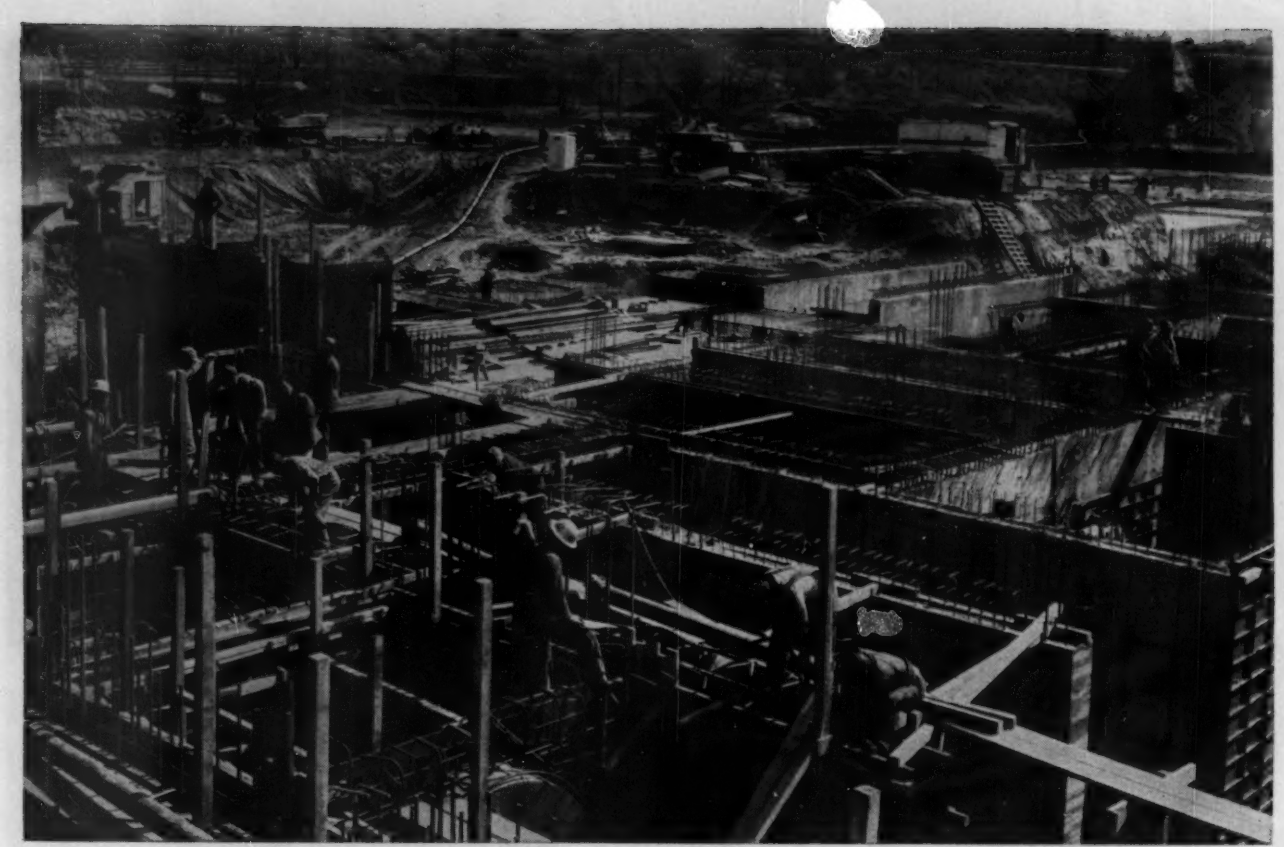
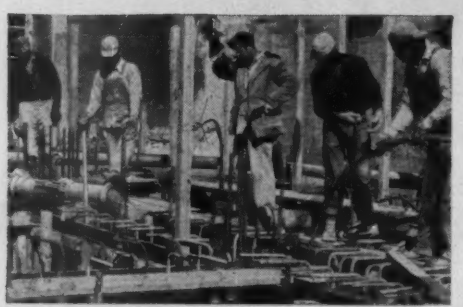
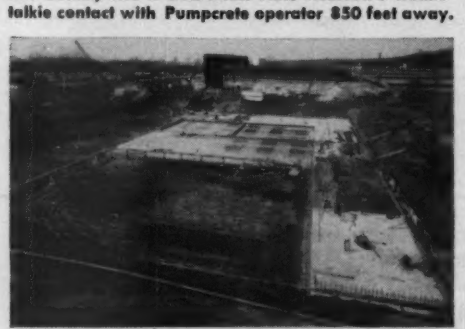


Pumpcrete, located at central mixing plant, pumps concrete 850 feet to forms. The slim pipeline can be laid wherever desired—never interferes with construction crews.



Here you see concrete pouring from the end of the pipeline directly into a wall form. Note foreman's walkie-talkie contact with Pumpcrete operator 850 feet away.



Pipeline is set in position for next section of foundation slab for filter house. Two pipelines were used, one for the filter house (foreground) and one for the pump house (background).

Pumpcrete® pipes concrete 850 ft. to forms—speeds work, cuts costs on filter plant

Placing concrete for new filter and pump house additions to the Kansas City, Missouri, water works, was a natural for Rex Pumpcrete—the pump that delivers concrete by pipeline.

23,000 cubic yards of concrete for the two buildings will be placed by The Salvatore S. Patti Company, Kansas City, contractors. The new buildings cover an area 300 by 600 feet with a total height of 65 feet. So as not to interfere with construction crews, Pumpcrete was located conveniently next to the central mixing plant 850 feet from the work area.

By pumping concrete direct to the forms, it was possible to eliminate costly preparatory work and minimize the size of the placement crew. Contrast this with the elaborate and expensive system of buggies, lifts, runways, trucks needed for conventional placement methods.

The Salvatore S. Patti Company knows Pumpcrete well—enthusiastically reports savings in time, labor and materials on this and many placement jobs it has done in the past twenty years with this pipeline placement method. Why not investigate Pumpcrete for your work? See your local Rex Distributor, or write Chain Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wis.

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SEALING COMPOUND is applied during installation of exposed asphalt lining. Sealant is cold applied asphaltic mastic.

GASOLINE-POWERED WINCH drags asphalt panel up reservoir side slope. Panels stand normal handling without damage.

Asphalt Panels Line Reservoir

Asphalt panels, ½ in. thick, have been used to line a 5-mg reservoir in northern California to reduce leakage to a minimum. The work was done on the clear well for the San Pablo filter plant of the East Bay Municipal Utility District, a water utility serving Oakland, Calif., and a large surrounding area on the east side of San Francisco Bay. This is one of the first municipal water reservoirs in the United States to be lined in such a manner.

The material used is an impervious, reinforced, molded asphalt lining similar to but much heavier than roofing felts. Weighing 3 lb per square foot, it was supplied in 4x25-ft panels. Two types of watertight joints were made using a cold applied asphaltic mastic: (1) a lapped joint and (2) a butted joint that is sealed with an overlay strip.

The reservoir was built on a side hill location more than 30 years ago. The concrete slab lining never has been bottle tight, and leakage together with a considerable amount of groundwater caused some sloughing of the hillside years ago. Movement of the ground was effectively stopped by a gravel-filled drain ditch. But the lining was cracked and timber columns supporting a wood roof were displaced. This year, a new precast concrete roof was added to the reservoir. Just before this work was done, a gravel underdrain system was placed beneath the concrete slab. To complete the renovation job, some form of lining was desired in order that further leakage would be considerably minimized.

After looking into the various possibilities, EBMUD engineers settled on the asphaltic lining. Aside from the economy of the lining, one of the main reasons for selecting it was that installers would guarantee it against excess leakage.

Maximum leakage permitted by EBMUD engineers was 5 gpm. The contractor guarantees this limit for a period of two years.

Leakage, measured by the newly installed underdrain system, has closely approached the minimum guarantee. But as this is written it has not yet been established whether or not the guarantee has been met.

Contract cost of the work was $24,765; the contractor, Elmer J. Freethy of El Cerito. For the 63,500-sq ft surface, this amounts to 39¢ a square foot.

The panels were delivered by truck and stockpiled on the reservoir floor. Concrete was cleaned by sweeping and the panels laid in place. On the reservoir floor, the panels were moved by dragging them along the floor. For the 2 on 1 and 1½ on 1 side slopes, panels were hauled into place by a gasoline-powered winch.

Care in making the joints was an essential to a leakproof job. But when made properly, the joints are stronger than the panel proper. Careful joint work was particularly important particularly around the pedestals of the columns. A tight seal was assured as the result of proper use of the asphaltic sealing compound.

The ½-in. thickness of the asphalt panels include layers of asphalt on each side with layers of asphalt-impregnated felt near each side. The interior is filled with a mixture of asphalt and inert fillers. The mastic sealer is an asphalt with asbestos fibers and inert fillers.

The sealer is made plastic by a solvent that makes it possible to apply it cold.

Similar linings have been used elsewhere for irrigation ditches, farm ponds and the like. In such cases it is usually applied direct to rolled or compacted soil. The asphalt sheets assume the shape of the underlying surface and will take some settlement while in service.

Material used was Panelcraft made by Envoy Petroleum Co. of Long Beach, Calif. Phillip L. Bailey was the representative of the Envoy Co. on the work.

The reservoir lining is a project of the East Bay Municipal Utility District for whom R. C. Kennedy is chief engineer. Design was under supervision of J. W. Trahern and construction under supervision of George Colby.

SPIDER-WEB FRAMING of dome was built from the outside in. Successive rings were supported on scaffolding until their components were fastened together.

Steel Dome Key to Low-Cost Building

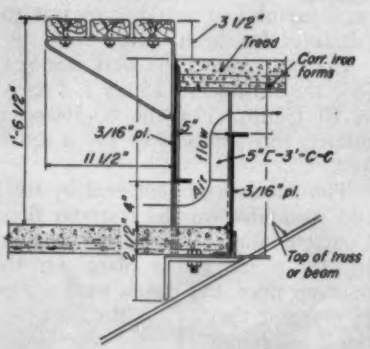
Jesse Yeakel
Structural Engineer
Oklahoma City, Okla.

A cost of $0.41 per cu ft, or $11.00 per sq ft, has justified the choice of a circular field house framed in steel for the Capitol Hill High School at Oklahoma City, Okla.

Thirty-two steel columns, 41 ft high, equally spaced around the perimeter of a 200-ft diameter circle, support a tension ring for the dome that roofs the field house. The dome framing includes 32 trussed radial ribs forming chords of 170-ft radius vertical circles rising toward the center. Inner ends of the ribs frame into a 32-ft dia circular plate girder, atop of which 32 vertical posts support the roof of a louvered "lantern." Between the tension ring and the lantern girder are three compression rings. The lantern girder forms a true circle, but the other compression rings are made of straight members.

• **Novel upset rods**—Lateral bracing in the dome consists of diagonal rods connected with clevises and turnbuckles. Specified to be upset at the ends to compensate for loss of section due to threading, the rods were instead equipped with threaded stubs welded on the ends. The required section was thus provided without the necessity of heating and upsetting the rod itself. Physical tests to destruction were made of specimens of the welded upset to verify that any failure of the composite rod would occur in the rod itself and not at the weld.

• **Erected from outside in**—Erection of the steelwork proceeded as follows: 1. The perimenter columns were set and tied together by spandrel beams. 2. The tension ring was placed and joined to the columns by rib bolts—which were used for all field connections. 3. Tubular steel scaffolding was erected for the first compression ring. 4. Members comprising this ring were erected, together with the first section of the 32 radial ribs. Ring components were initially held in position by the scaffolding, which had screw adjustments for raising and lowering. 6. After all rib bolts in the compression ring were tightened and checked for elevation, the scaffolding was lowered and moved into place for the second compression ring. 7. Erection proceeded thus to successive rings until the lantern girder was reached. One crawler erected all the steel, using an 85-ft boom with a 15-ft jib.



SEAT RISER incorporates air passage to improve ventilation.

Stress in the tension ring under full load will be 505 kips, while stresses in the compression rings, from the outside in, will be 147, 128, and 141 kips, with 225 kips in the innermost compression ring or the lantern girder.

The exterior walls are 12 in. thick. They consist of concrete block with a red brick facing. Floor construction, except for the playing court and basement areas, is 2¼ in. of concrete placed on paper-backed wire mesh, which is supported on open-web steel joists.

The dome is topped with mineral-surfaced roofing placed on a fiberboard deck supported by bulb tees. Tar and gravel roofing is used in place of the mineral-surfaced roofing where the dome roof breaks to a flat roof and extends out from the tension ring.

Ventilation is provided by intake and exhaust grilles in the exterior walls. There is sufficient fan capacity to change the air every five minutes. Fans mounted high in the dome exhaust the upper stratum of air through adjustable louvers in the lantern above the dome. Supply grilles, 38 ft wide and almost 9 ft high, are provided at each end of the playing court to bring in fresh air.

• **Bleachers circulate air**—The manner in which fresh air is brought to the spectators is believed to be somewhat unusual. By means of an S-shaped passage, air from above flows under the spectator's seats and beneath the bleachers. Each riser is made of two bent steel plates with the vertical stems 5 in. apart, facilitating an even flow of air all along the seats. There are no grilles at the seats that would cause discomfort to those at or near them.

The cost of the structure was $790,000, and its volume is 1,930,000 cu ft. There are about 430 tons of structural steel in the building and 60 tons of long span and open-web joists.

The field house is part of an existing high-school layout that has classrooms, athletic field and tennis courts. There will be a covered walk connecting the field house to the classroom section of the high school.

All firms connected with the work were from Oklahoma City. Architectural and structural designs were by Coston-Frankfurt-Short. Fabrication of structural steel was by Capitol Steel & Iron Co.; erection of steel by Allied Steel Erection Service; and preparation of structural steel shop details was under the direction of the author. The general contractor for the field house was the Weller Construction Co.

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The sheet material pictured here is called "Fire-Snuf." It comes to you with a *specific flame spread rating*. It is listed and labelled by Underwriters' Laboratories.

Sheet like this, made of HETRON resin, will burn only when a hot flame is directly applied to it. It "snuffs out" as soon as the flame source is removed.

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ENR staff photos

PAVING TRIO—Bituminous finisher, (background) tandem roller, and rubber-tired roller—convert brick-and-cobblestone to smooth traffic arteries by resurfacing with two-course asphaltic concrete.

Street Resurfacing Is a Science in Minneapolis

- **New techniques were developed**
- **Special-purpose equipment is used**
- **Good public relations are paramount**

There's more to street resurfacing in Minneapolis than meets the eye. According to City Engineer Hugo Erickson it's a complex mixture of construction and public relations. And this doesn't mean just ordinary run-of-the-mill construction, or so-called public relations in the form of flagmen or "Detour–Street Repair" signs directing traffic around the construction site.

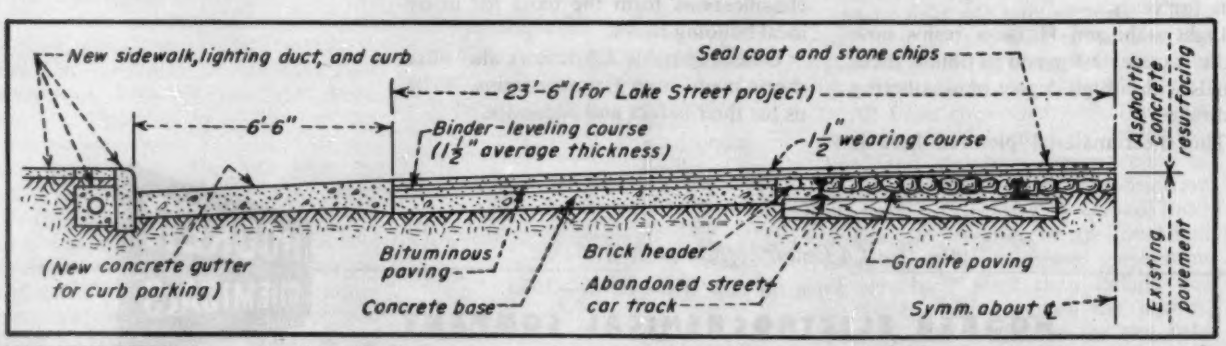
• **Biggest program**—By the end of this construction season Minneapolis will be half finished with the biggest street improvement program in its history. It will total about $4 million, exclusive of alley paving.

The program got started last year. It's hitting full stride this summer, and should be pretty well finished by the end of 1956.

About $2 million worth of the street resurfacing and reconstruction qualifies for federal and state aid. Nearly $1 million comes from county highway funds; plus $500,000 from special assessments on benefited property owners.

• **Short season**—"As to construction," explains Erickson, "our street resurfacing program must move fast due to the short season (April to October). It must be economical to stretch our paving dollars, while increasing traffic on certain arterial streets calls for a complete job of modernization. This means street widening, pavement patching and resurfacing as well as new curb-and-gutter, sidewalks and street lighting."

All these, and a number of allied operations, have been developed over the past two decades until street re-



HIGHEST TYPE of reconstruction calls for two-course asphaltic concrete resurfacing, new portland cement concrete gutters, curbs and sidewalks, and new street lighting. Typical example: The 26-block, $525,000 improvement project on Lake Street.

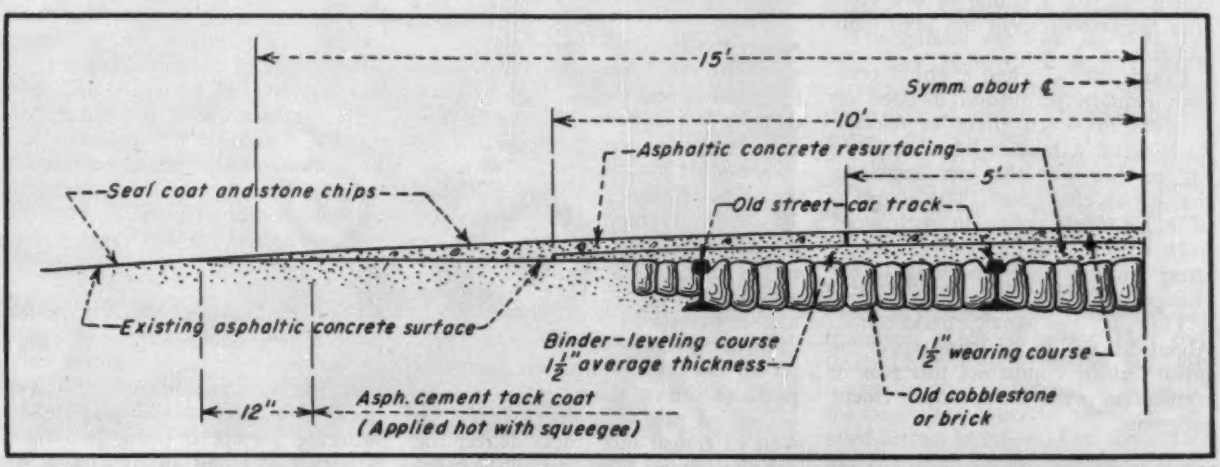
KEYSTONE of paving operations is the self-propelled finishing machine. Served with hot-mix asphaltic concrete by 10-ton trucks, it first lays a binder-leveling course on the "tack-coated" old brick; then doubles back to lay the 1½-in. wearing course.

OLD SIDEWALKS are ripped out with Paul Bunyan tooth puller bolted to bucket of tractor shovel (above) on the Lake Street widening and resurfacing which called for new 6½-ft wide gutters of concrete (below); also new curbs and sidewalks.

surfacing today is a science in Minneapolis.

This is especially true in resurfacing and improving old pavements containing abandoned street car tracks, of which there were about 100 miles spread out over the city. New techniques and even new equipment have been developed for doing a better job of resurfacing, according to the city's paving engineers.

• **Begins at home**—Good public relations in connection with the numerous, widespread improvement projects



ABANDONED STREET CAR tracks in structurally sound pavement are buried under 3 in. of asphaltic concrete resurfacing, 30 ft wide, to improve riding qualities and increase traffic capacity of the streets. Cost of this work runs $20,000 to $30,000 per mile.

struction highlights of the job, ac-

. . . Resurfacing is a science

in the $4 million program is a "grass-roots" problem, contends Erickson.

"It must begin at home," he explains, "with the merchant, the home owner, the local motorist and the pedestrian. For we must live with these neighbors of ours, and convince them that we have their interests at heart."

"For one thing," says Erickson, "we never close a street being resurfaced for any great length of time, although it may be kept open only on a limited basis. Since most of this work is done with our own forces, our operations can be varied to cause as little inconvenience as possible to the merchant who insists on business-as-usual despite the torn-up street in front of his shop."

Entrances to such establishments usually are paved with high early strength portland cement concrete. Or, where a business establishment has two entrances, the concreting crew skips one until the other one has been installed. Where possible, single entrances are paved on Friday so they can be used by traffic by Monday.

• **Get-tough-policy**—One aspect of Erickson's public relations requires that a get-tough-policy be enforced. It's in the utilities field. Public and private utility companies are advised well in advance of the start of each improvement project, to permit relocation of their facilities such as gas lines, telephone and electric power cables, steam lines, telegraph cables.

According to city ordinance, a resurfaced street can't be opened up for additional changes, except in an emergency, for a period of five years after the improvement has been completed.

Consequently, when a utility company requests permission to open up a newly improved street to relocate its facilities it takes a bit of explaining to convince the city engineers that it's an emergency. The adoption of a get-tough policy in such cases helps keep the utilities alert on future street improvement involving utility changes.

This is no small undertaking. About $1 million is being spent by private utility companies this year in connection with street improvement programs.

• **No street cars**—There are no street cars in Minneapolis. The last line was abandoned two years ago, leaving 100 miles of unused track in the city.

BEFORE-AND-AFTER: Rough riding Lake Street with its abandoned street car tracks (at left) becomes an efficient four-lane thoroughfare plus curb-parking on both sides (at right) when given the resurfacing and reconstruction treatment.

This posed a special problem. Should the old rails be removed and salvaged for scrap, or should they be left in place and covered with the bituminous surfacing?

From a dollar-and-cents standpoint, the answer was obvious. Leave them in place. Here's why: The rails can be removed for $15 per ton and sold as scrap for $20 per ton. But the rub comes in rebuilding the roadbed that would be damaged during removal of the rails. One horseback estimate places the cost of rebuilding this roadbed ready to receive the bituminous surfacing, at about $250 per ton of rail salvaged.

The net result is that the city leaves the old rails in place, except where the supporting roadbed, or track structure, is already so deteriorated as to necessitate rebuilding it.

• **City forces**—Minneapolis believes in using its own equipment and labor for street resurfacing, rather than doing it by contract. This isn't a new departure. The city has operated its own asphalt plant for nearly 40 years. Total plant capacity today is about 100 tons per hour. This hot-mixed asphalt is delivered to the pavers, or finishers, by a fleet of dual rear-axle, 10-wheel dump trucks, each carrying a 10-ton pay load.

Minneapolis also owns a completely integrated, automatic ready-mix portland cement concrete plant with a 2-cu yd mixer. A fleet of thirteen 4-cu yd transit mix trucks deliver the concrete from this centrally located plant to the various street projects.

City Engineer Erickson talks with considerable pride of the accomplishments of his 17 construction crews totaling about 400; as well as another 200 men engaged in street maintenance, repair and resurfacing.

"To a considerable degree," he explains, "we are proud of our force-account or day labor system which has been in effect for many, many years. We have practically no political interference. We deal with the labor unions on the same basis as the contractors do; we pay the same wage scales and, essentially, expect the same labor production as the contractors get. Moreover, we are more flexible in our operations. This is an advantage in city work which often requires day-to-day changes."

• **The full treatment**—Basically, resurfacing the 100 miles of streets carrying the abandoned street car lines falls in two categories. As shown in accompanying sketches, in one case a 30-ft width of asphaltic concrete is laid over the old pavement and rails.

In the other case, the street gets the full treatment in modernization. This means widening, strengthening the old pavement and resurfacing it with asphaltic concrete, new curbs and gutters and perhaps a new system of street lighting.

• **Lake St. project**—Biggest single project now under way, and typical of this high type modernization, is on Lake St. between 3rd and 29th Avenues. This 26-block widening and resurfacing project is being performed by city forces and equipment, at an estimated cost of $525,000.

Here, briefly, are some of the con-

FINAL OPERATIONS on all resurfacing projects include: applying seal coat of hot asphalt emulsion (at top), spreading stone chips (at center) and thorough rolling with a rubber tired roller (at bottom).

struction highlights of the job, according to Gordon Bodien, city paving engineer.

The old double-track street car tracks are left in place, except where their supporting roadbed is in such poor condition that it must be removed and replaced with a portland cement concrete pavement. The remainder of the old cobblestone, brick or asphaltic concrete pavement is patched where necessary with concrete.

Raising and adjusting existing manhole covers to match the street surface is an expensive problem. Normally, the resurfacing material is laid right over the manholes, with the covers being adjusted to grade later, by the use of adapter rings.

Chief objective of the project, explains Bodien, is to develop the traffic-carrying capacity of Lake St. to a maximum. To start with, covering the old street car rails with asphaltic concrete has a good psychological effect. Instead of avoiding the old rails, motorists use the entire street.

The old 50-ft street also is being widened to 60-ft curb-to-curb by cutting 5 ft off of the existing 15 ft sidewalks.

Curb parking had to be provided along each side of the street, yet every extra foot width of curb parking meant robbing width by an equal amount.

Previous experience with parking lanes had shown the engineers that a 6½ ft width was adequate. In fact, motorists tended to park too far from the curb if a 7-ft width was furnished. But on a 6½-ft width parking lane they pulled right up to the curb.

• **Parking gutter**—Consequently a 6½ ft wide glorified gutter of portland cement concrete is built along each side of the street, as a parking strip. This leaves a 47-ft central width of resurfaced street for four traffic lanes.

The gutters are 8-in. thick at the curb and 10-in thick at the inner edges where they join the bituminous surfacing. At bus stops these paved gutters are widened to 10 ft for a distance of 80 ft. The 8-in. high curbs are cast in place, independent from both the gutter on one side and the new sidewalk on the other side.

• **Bituminous resurfacing**—The 47-ft width of resurfacing between the 6½-ft gutters is placed in one 11-ft and three 12-ft strips. The old rails are covered with a minimum of 3 in. of the asphaltic concrete which is applied in two layers—a 1½-in. minimum leveling and binder course, and a 1½-in. wearing course.

The asphaltic concrete is produced

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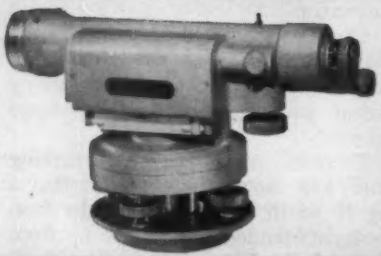

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. . . Resurfacing is a science

in the city's asphalt plant using crushed aggregate and an 85-100 penetration asphalt cement. It is delivered to the job in the city's 10-ton dump trucks and laid down with a conventional bituminous finisher or paver.

A 13-man crew made up of one paver operator, two roller operators, nine workmen and a foreman can lay about 400 tons of the asphaltic concrete per day. This covers about 400 ft of pavement 47 ft wide, or 800 ft of single course.

• **Compaction techniques**—Most of the bituminous paving and finishing operations follow generally accepted procedures. But the techniques of compaction, developed over the past two years by the city's paving engineers, have proved highly satisfactory.

Here's how it happened: The key to the development, according to Bodien, is the use of self-propelled rubber-tired rollers in addition to the smooth surfaced, steel-tired rollers used on bituminous paving jobs.

When Minneapolis started covering up its abandoned street car tracks two years ago, steel-tired rollers didn't seem to do a proper job of compacting the asphaltic concrete over the old cobblestone and irregular brick paving. They tended to bridge over the interstics without adequate compaction. Newly laid stretches of surfacing soon developed ripples in the vicinity of the old tracts, and even the outline of the cobblestones began showing up in the new surfacing.

• **Kneading action needed**—Convinced that the "kneading" or flexible compacting action of rubber-tired rollers was necessary to do a satisfactory job, Bodien's engineers started using a tractor-drawn rubber-tired roller. This was satisfactory to a degree, but not the complete answer. The roller was difficult to maneuver, especially in downtown areas where considerable turning was necessary.

Self-propelled rubber-tired roller obviously was the answer. About this time two roller manufacturers—Bros of Minneapolis and Tampo of San Antonio—came out with self-propelled rubber-tired rollers. One model has nine wheels and the other has eight. Each rig carries about 2,000 lb dead load per wheel.

At first, the city rented one of these rigs. Results were so satisfactory that the city bought it and, since then, has purchased two more.

The rubber-tired rollers don't eliminate the use of the steel-tired rollers by any means. The engineers soon discovered that the rubber-tired rollers couldn't work closely behind the bituminous paver. The asphalt was too hot for the tires and it also stuck to them.

• **Three-way rolling**—After considerable experimentation by trial-and-error a satisfactory procedure was developed. It works like this, explained Bodien: "First we hit the newly laid asphalt lightly with a steel-tired roller working close behind the finisher. This gives initial compaction and cools the surface enough to take the rubber tired roller, which furnishes most of the compaction, during several passes. Then the final rolling is done with the steel roller to give a smooth-riding surface free of tire tracks."

• **Resurfacing only**—A number of streets need only partial resurfacing to cover up the existing street car tracks. In this type of improvement, which costs $30,000 to $40,000 per mile, a 30-ft width of bituminous concrete is laid over the old rails.

It is laid in two cources. A combination leveling and binder course, 20 ft wide and 1½ in. minimum thickness is laid over the old rails and cobblestone. Over this, a 1½ in. wearing course is laid in three 10-ft widths, with the outer edges tapered to meet the existing street surface.

The tapered edges of the resurfacing material is joined with the old surface by a 12-in. wide tack coat of hot asphalt cement, applied with a squeegee just ahead of laying the bituminous resurfacing. This produces tight adhesion between the old pavement and the new asphaltic concrete overlay.

• **Seal with chips**—In all the resurfacing operations a tack coat of hot tar is applied by pressure distributor well ahead of laying the asphaltic concrete. Final operations include the application of a seal coat of asphalt emulsion spreading a thin layer of stone chips and working them into the new pavement with a rubber-tired roller. Excess chips are swept up by mechanical brooms and removed from the finished pavement.

These operations follow generally accepted practice, with one exception. In general, only the rubber-tired rollers are used to roll the stone chips. Using the steel-tired rollers for this operation, contends the paving engineer, would cause more degradation of the stone chips.

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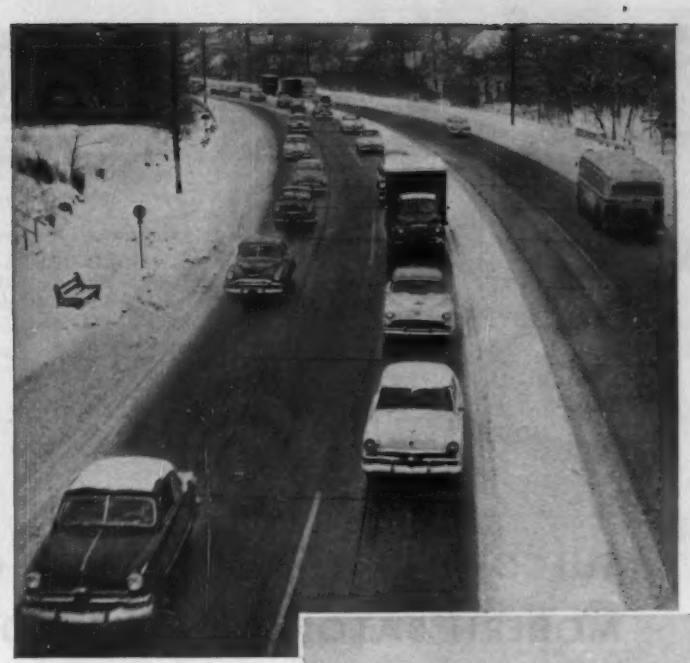

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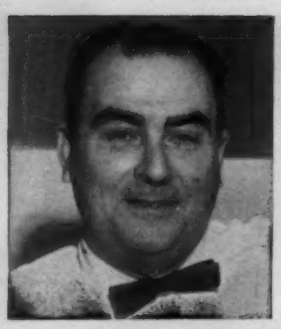

Roofing-Contractor's Superintendent (at left)
JACK OWEN says, "You've got a roof of superior strength when Corruform and Tufcor are used. Big savings in time and labor costs because these materials are easy to place and weld."

Contractor's Representative (at right)
HAROLD HERES says, "Corruform and Tufcor keep the entire job moving ahead on schedule. That means savings in construction costs."

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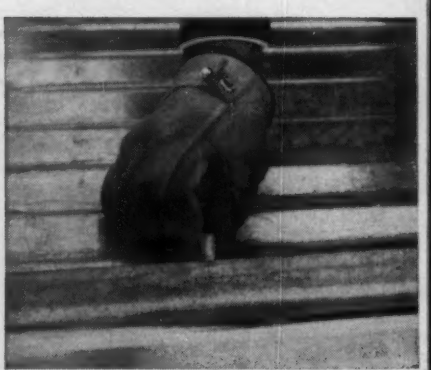

Vent Clip Prevents Vapor Pressure Build-up. Granco vent clips, inserted on lip of each sheet, one between each support, prevent vapor build-up in roof slab under intense summer sun.

Granco Products keep job on schedule, reduce labor costs, save time.

BATON ROUGE, LOUISIANA—One of Louisiana's most modern schools is scheduled for fall completion. Situated on the northern edge of this capitol city, the Glen Oaks School consists of five buildings, connected by covered walks.

Heavy Duty Corruform and Tufcor, specified for the buildings' roof slabs, contributed to substantial savings in time and labor costs. For example, on two of the Glen Oaks buildings, 30,000 square feet of Tufcor was laid in 30 hours.

Harold Heres, Vice President of Caldwell & McCann, contractors on the new Glen Oaks School, says, "there are no unexpected slow-ups when Tufcor or Corruform are specified. That's what we like about these materials—you can be sure you've got a tough, strong roof and construction is much faster."

Pre-cut to fit the building frame, Tufcor and Corruform sheets arrived at the Glen Oaks building site ready for placing. As soon as structural steel frame was completed, crews were able to place and weld units to frame and the concrete placing operation started immediately.

Tufcor and Corruform make roof construction a simple, fast operation, resulting in time and material savings. For information, estimates or costs on your building plan, contact home or district office, attention Dept. E-2.

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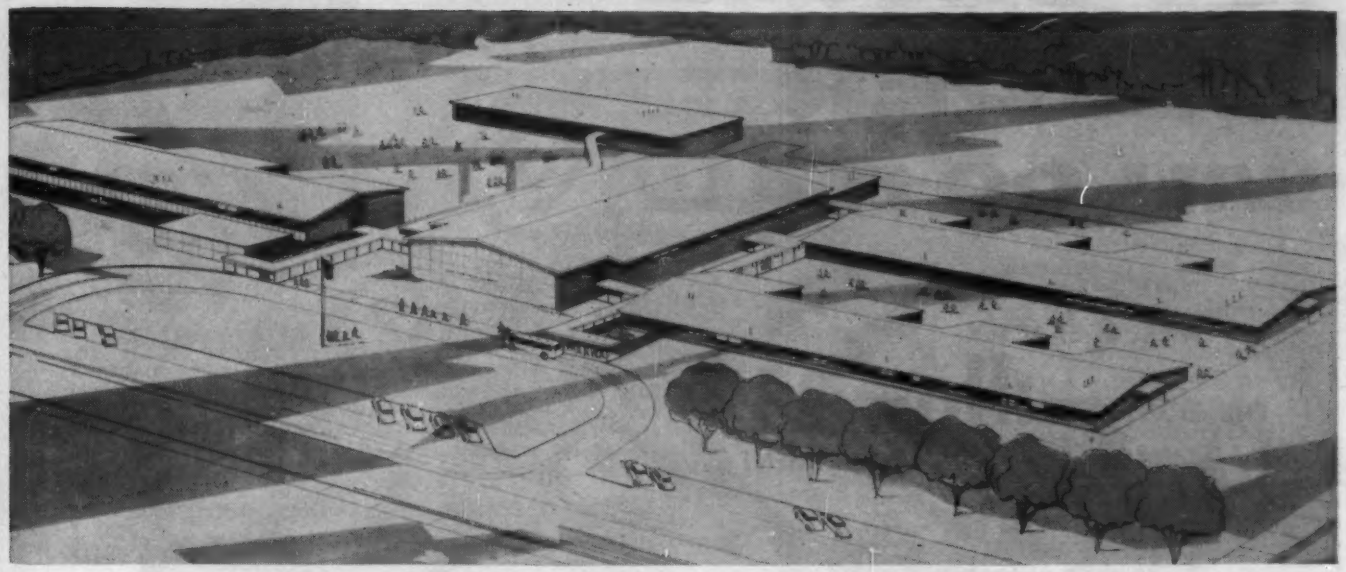

Glen Oaks School, *Baton Rouge, Louisiana* • Architects: *Manson and Thompson, Baton Rouge, Louisiana*
Associate Architects: *Goodman and Miller, Baton Rouge, Louisiana* • Contractor: *Caldwell & McCann, Baton Rouge, Louisiana*

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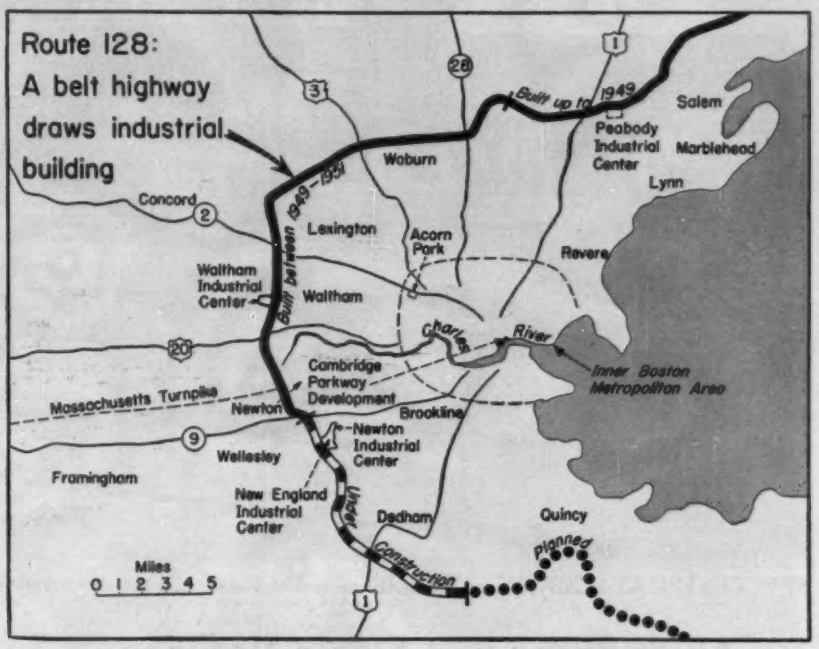
Boston's Route 128 is usually considered the classic example of a belt highway around a metropolitan area. Here's the story of how a "package developer" saw the possibilities for light industrial plants. Result: many millions of dollars in construction.



Bringing Industry to the Suburbs

J. P. Chamberlain

Associate Editor

In the construction business, the "package deal" goes a long way back. That's the arrangement by which one firm provides all or most of the elements that bring a projected industrial or commercial building into reality for a client or group of clients. There are a good many steps in this process. But the major ones are site location, purchase and (where necessary) rezoning, financing, site development, design, and construction. In recent years, the developer often has continued to own the property and rent it to the client.

Nobody knows who originated the package deal, though some give credit to the well-known developer John Galbreath, who was putting together such propositions in the 1930's. But the basic idea goes back much further than that—at least as far as the early 1900's, when Stone & Webster and Ebasco were starting to provide financing, engineering, construction supervision, and management to the u tility industry.

• **All-inclusive**—No one has developed a more all-inclusive package, however, than an enterprising Boston firm with the proper Bostonian name of Cabot, Cabot & Forbes Co. CC&F's boast is that it provides all the technical and financial services necessary to put up a factory, warehouse, laboratory, office building, or retail store.

To a prospective client, the appeal of the package is that he knows in advance (in the form of a quoted annual rental if he wants to lease, or in the form of a lump-sum bid if he wants to be owner) just what the full cost of his building will be. The executives of the client company—particularly if it is a small one—often know little about site location. Usually they know nothing about site development, and sometimes not very much about buildings.

All this is taken care of in Cabot, Cabot & Forbes' package. The client can do his own site location, land purchase, and so on, if he wishes. Or he can leave it for the developer. There will be no unexpected extras. And there will be one firm to take responsibility.

• **Up from nowhere**—Though the name has long been established as a building-management firm, CC&F has come up from nowhere in industrial development during the past few years. Many people around Boston credit it with being the first to see the possibilities of industrial sites along Boston's belt highway, the new Route 128. At any rate, CC&F has done much of the industrial construction so far along 128. It has already developed three industrial districts there, is opening another, and has cornered a number of other feasible industrial sites along the highway.

• **Classic case**—The new Route 128 (see map) is an expressway that is gradually being built around Boston. It replaces a circuitous highway that ran through every village and city along the way. 128 is usually regarded by highway engineers as the classic example of what a belt expressway around a metropolitan area can do for industrial development in the suburbs.

In the past few years, quite a few individual plants have built along 128. But so far CC&F has taken the lead in district development. The firm has also developed two districts within central Boston. It also put up several other buildings outside of the Boston area, as far away as Denver and Richmond. It is starting another district near Hartford. And it hopes to expand its service on a nation-wide basis.

• **Bought Aberthaw**—To round out its package, CC&F this summer bought stock control of a famous old Boston builder, Aberthaw & Co. Till that time, it had worked in close cooperation with another local construction outfit, Vappi & Co., Inc. But

NEW CENTER AT PEABODY, on the northern end of Route 128, gets advertised by a fancy CC&F sign.

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CC&F wanted to control its own construction firm, and Vappi wanted to stay independent. As a result of the take-over by CC&F, some of the senior Aberthaw executives are retiring, and two younger men with previous Aberthaw experience are returning to the company.

CC&F does its own engineering, architectural design, and surveying. But the firm emphasizes that it is not in competition with independent engineers and architects, because its technical staff works only on its own package projects.

Aberthaw, however, will continue to undertake outside jobs as a building contractor.

• **Under one hat**—As already mentioned, many developers are accustomed to gathering a group of interested parties—financiers, architects, engineers, and contractors—for a specific project or group of projects. But having all these groups in one firm smooths things out quite a bit. Gerry Blakeley, Jr., one of the three young principals on the company, explains it this way:

"We have coordination right from the start. Instead of the different technical groups sitting down together to agree on plans after they have already done their own thinking separately, we keep in daily touch—and most of us are in the same office. Second, by having a complete staff of technicians we can work on several projects at once. And third, by specializing on package deals, we build up a reservoir of experience for future jobs."

• **New situation**—Blakeley joined the firm right after World War II, when plans were being made to extend the new Route 128 from the initial segment north of Boston (see map) right around the city. At the same time, it was becoming obvious in the Boston area—as elsewhere around the U. S.—that multi-story factory buildings were obsolete in comparison with more efficient one-story factories. Industry in the Boston area had to have more space for expansion, and at the same time had to cut costs.

• **New idea**—Blakeley and his partner Alexander Forbes (a son of F. Murray Forbes, an original partner who is still in the business) soon saw the possibilities of this situation. Why not, they thought, pick out the best industrial sites along future Route 128, get them re-zoned where necessary for light manufacturing, warehouses, labs, and office space? These sites could be developed as industrial districts, convenient to truck and rail transport, near Boston and yet outside of its congestion and high tax rates. By doing this, they could offer prepared sites and a complete design-and-construction service. The client could either rent or buy.

• **Industrial districts**—There is nothing new, of course, about industrial districts. They have existed in the U. S. for years, usually developed at cost or less than cost by railroads interested in increasing on-line freight. But there were already some privately-owned districts in operation when CC&F began work on its development.

The partners started carefully studying the land along the future route of the new 128. As might be expected, for one reason or another a very high proportion of the road frontage was unsuitable. But they found some good sites. One of their first projects was to assemble 46 acres of land for a district in the Town of Newton, just off the future route. Since this area was already zoned industrial, one important and time-consuming step was eliminated.

• **Steps in development**—But there were many other steps. Before the land was bought, its sub-soil conditions had to be checked. Next, it was necessary to be sure that a rail spur could be arranged for, and whether power, gas, water, sewage-disposal facilities, and drainage would be available. After the land was bought, it had to be graded, roads and utilities put in, sewers, storm drains, railroad track and sidings built. This involved a heavy investment, which CC&F partly financed by selling off profitably, at this time and later on, some of the smaller sites it had acquired along 128.

• **Newton district**—The Newton In-

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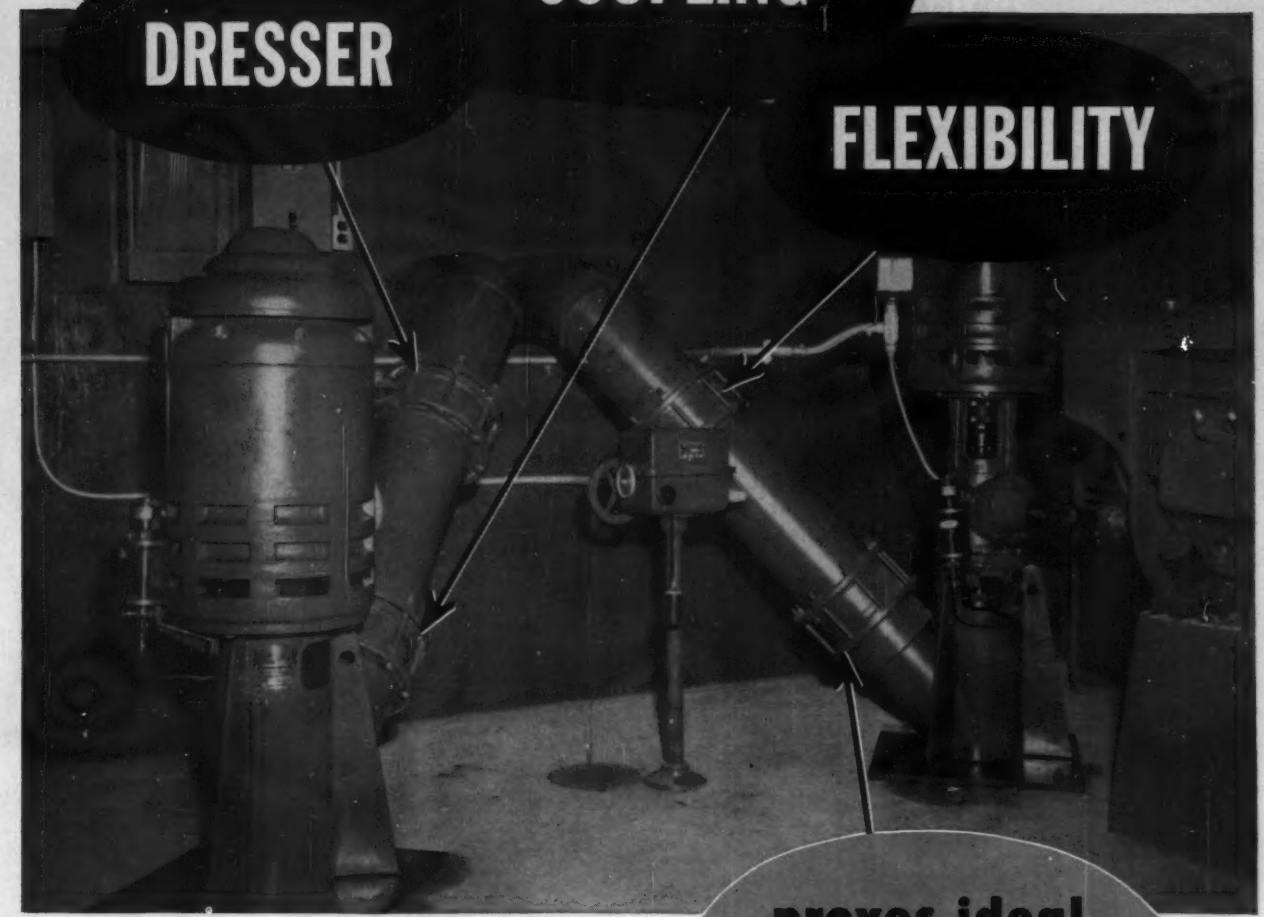

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BUSINESS PROFILE

dustrial Center was to be a "garden-type" district. No industry could be admitted that gave off smoke or poisonous sewage. Factory buildings in general were to be one-story, conforming to an overall plan. Setback rules were enforced. There was broad allowance for lawns and planting. Off-street loading was to be used wherever possible, and there was to be no open storage.

The first tenant at Newton was Sunshine Biscuit, which occupied its office-and-warehouse in November 1948. This was soon followed by a similar building for another food company, John Sexton & Co. But it was more than two years before any other clients came into the center.

• **Cambridge**—Meanwhile, the firm was assembling land for what became in 1950 the Cambridge Parkway Development, a four-acre site near downtown Boston, but out of its congestion and close to through highways. Du Pont was the first tenant here in December 1950 with an office-warehouse, and Parke, Davis & Co. followed with a similar setup. Bob Linnel, of Nordblom Co., a brokerage firm that had helped assemble the land, joined the firm as a partner.

By this time, things had started to roll at the Newton district. The Buick Division of General Motors Corp. broke GM policy by leasing an office-and-warehouse. Several other clients followed.

• **Other directions**—The company was taking on new business in several different directions. It built an individual plant outside of its districts—for Raytheon in nearby Waltham—on a package-lease basis. The firm started assembling land for Acorn Park, another small district in Cambridge. And it got an assignment from American Can Co. to build a large office-warehouse in Portland, Me., on a package-lease basis.

• **Biggest deal**—Before these jobs were finished, CC&F had started on its biggest and most complicated district deal to that time—the 156-acre New England Industrial Center in the Town of Needham, right across the Charles River from the Newton Industrial Center (map).

The land for this had been assembled back in 1947. Part of it had been owned by the City of Newton's Water Department, and the rest by 15 private owners, including 11 brothers and sisters who were not on speaking terms. Purchase from the 11 co-heirs was finally arranged through a lawyer whom they all trusted. (The lawyer, as it happened, died a few days after the papers were signed.)

But the purchase of land from the Water Department was even more delicate. Says Gerry Blakeley: "A land transfer of this kind is just about as difficult and as politically hazardous as a zoning change."

• **Rezoning**—After holding the land for several years, in late 1951 the firm asked for a zoning change. It was fortunate for CC&F that the Town of Needham took six months to discuss the rezoning proposal in a series of meetings. Needham is "estate country", and many residents in the town were opposed to bringing in industry. At the same time, Needham had to have new sources of tax revenue or else raise taxes. Its schools were old, its teachers on low salaries.

But townspeople were afraid that industry would bring a flood of new low-income residents, whose children would have to be educated at the expense of other taxpayers. They thought the plants would smell and look unattractive, and that adjoining property values would suffer.

While the rezoning was being discussed, Blakeley and other people in the firm told their story to members of the town planning board and other civic leaders. The local papers helped by answering questions in their editorial columns.

• **Blakeley's case**—At a final town meeting in the spring of 1952, the rezoning came up for a vote. Blakeley summed up his case.

In the first place, he was able to prove that plants in a "garden-type" district would be attractive, and that on the basis of experience with the Newton district they would be likely to improve values in the neighborhood. Of course, they would provide tax revenue as well.

In the second place, he could show that, because of the nature of Route 128, most workers in the new plants would be able to reach their jobs by car in reasonable driving time. Every major highway out of Boston connects with 128 like spokes in a wheel. As traffic congestion and increased development slowed traffic in the area inside the wheel, 128 had become the fastest route even between points within the arc. Past experience at Newton, Blakeley told the Needham voters, showed it was unlikely many people would move into the town to be nearer their jobs.

• **Rezoning wins**—Though at the start

(*Continued on page 53*)

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September 15, 1958

SUBJECT: Special Report to industry

It is generally recognized by engineers and corrosion experts that there is far more to stopping rust on a rusted surface, than just applying any type of material at a certain film thickness. Dry film thickness of a protective coating is important--but, it's what goes on UNDER the film surface that counts, too. The vehicle of the coating that's applied over rust must penetrate to bare metal, driving out the air and moisture that, in presence of metal, cause rust.

Rust-Oleum users, for over thirty years, have known that Rust-Oleum does exactly that through practical use and results of the application of the product. However, Rust-Oleum wanted to go even further in bringing you irrefutable proof of this penetration.

With this in mind, the Rust-Oleum Corporation consulted with technologists from the Battelle Memorial Institute in Columbus, Ohio, who conducted this important research project, utilizing radioactive tracing technique with C14 radioisotope to measure Rust-Oleum penetration. Now, after nearly three years of continued research, you can actually look UNDER the surface film and see how the Rust-Oleum specially-processed fish oil vehicle penetrates rust to bare metal.

The methods and results of this research, which are outlined on the following pages, are given in their entirety in a thirty-page report entitled, "The Development of a Method to Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings on Steel Specimens," prepared by Battelle Memorial Institute technologists. It is available to you without cost or obligation by request on your business letterhead.

Very truly yours,

RUST-OLEUM

Robert A

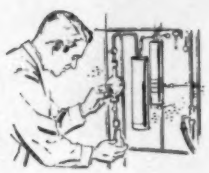
President

RAF/jc

Now! For the first time, actually look *under* the surface of the coating! See Rust-Oleum *penetrate rust* to bare metal through the "eyes" of radioactivity!

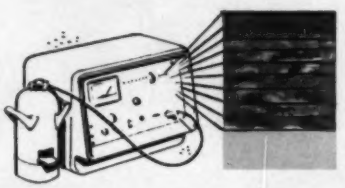
(A RUST-OLEUM REPORT TO EVERY PERSON FACED WITH A RUST PROBLEM)

Nearly three years of research, utilizing radioactive tracing with C^{14} radioisotope, enables you to follow Rust-Oleum penetration through the heretofore "unseen" rust area to bare metal. While Rust-Oleum users, for over thirty years, have known that Rust-Oleum penetrates rust to bare metal when applied over rusted surfaces—Rust-Oleum wanted to go even further in bringing irrefutable evidence of this penetration to you. The methods and results, on which the technical information on these pages is largely based, are presented in a complete thirty page report entitled, "The Development of a Method to Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings on Steel Specimens," prepared by Battelle Memorial Institute technologists. Request your copy on your business letterhead without cost or obligation.



1 To trace Rust-Oleum penetration through rust, the Rust-Oleum fish oil vehicle was made radioactive with C^{14} radioisotope. The radioactive Rust-Oleum fish oil vehicle was then formulated into Rust-Oleum 769 Damp-Proof Red Primer without changing Rust-Oleum's exclusive formulation or performance of product.

2 Rusted metal test panels were scraped and wirebrushed to remove rust scale and loose rust, according to Rust-Oleum's standard directions for application. The radioactive Rust-Oleum 769 Damp-Proof Red Primer was then brushed on directly over the remaining rust on these rusted test panels and allowed to dry.



3 Then—the surfaces of the rusted panels were shaved at approximate half-mil levels and Geiger Counter readings of Rust-Oleum penetration (radioactivity) were taken at each level down to bare metal. These measurements are shown as "Percentage of Surface Radioactivity" figures on the graph on the opposite page.

Dry film thickness of a coating is important, but, what goes on UNDER the film surface is vitally important, too, in the stopping of rust. Rust-Oleum Stops Rust, because it penetrates the rust to bare metal. The Rust-Oleum fish oil vehicle works around the rust particles and through the fissures and crevices in the rust formation to the bare metal. It doesn't "bridge-over" the tiny, microscopic pits in the metal—BUT, actually goes into these pits to drive out air and moisture and coat the metal with a penetrating, low-surface-tension film that expands and contracts with the metal. Because of this unusual penetration, you can apply Rust-Oleum 769 Damp-Proof Red Primer directly over the rusted surface after scraping and wirebrushing to remove rust scale and loose rust. Thus—you save time, labor, and money as costly surface preparations are usually eliminated.

From tanks, girders, machinery, roofs, sash, stacks, pipes, wire fences, and building maintenance in industry . . . marine, farm, or railroad applications . . . to gutters, metal sash, lawn furniture, etc. around the home . . . Rust-Oleum is the modern way to Stop Rust and beautify as you protect, in your choice of Red, White, Black, Aluminum, Gray, Green, Yellow, Blue, etc. May be applied by brush or spray and dries to a firm, *decorative* coating that resists salt water, salt air, heat, fumes, sun, humidity, and weathering. Industrial users see Sweets for complete catalog and nearest Rust-Oleum Distributor, or attach coupon on the opposite page to your business letterhead for complete information, including your thirty-page report on Rust-Oleum penetration. Homeowners will find Rust-Oleum featured at leading Hardware, Paint, and Lumber dealers in most localities.

there is only one Rust-Oleum . . . *it is distinctive as your own fingerprint*

RUST-OLEUM®

Rust-Oleum is exclusive. It incorporates a specially-processed fish oil vehicle that penetrates through rust to bare metal. It dries right and is free of objectionable odor. Many attractive colors.

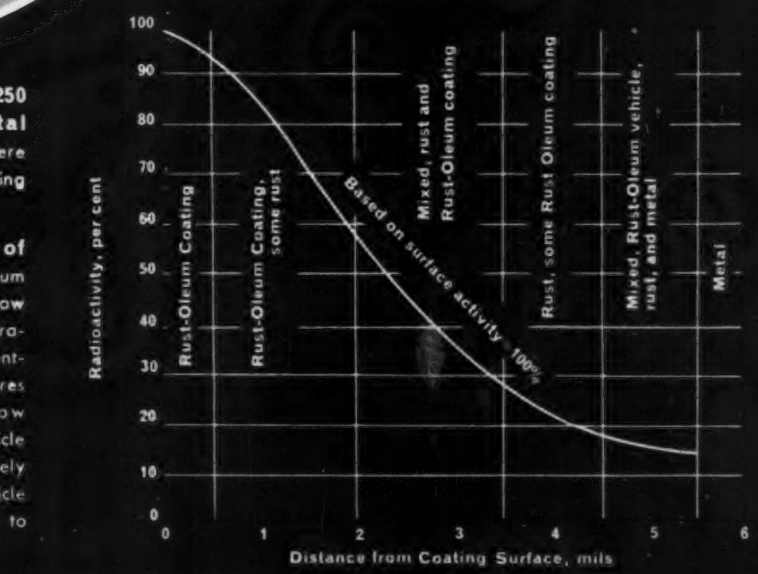
STOPS RUST!

A new Rust-Oleum development is the Rust-Oleum Galvinoleum coating. It sticks to new or old galvanized surfaces *without* etching, *without* weathering. Available in red, gray, green, metallic.

Photomicrograph (enlarged 250 times) of cross-section of rusted metal coated with Rust-Oleum.

Actual unretouched photomicrograph (enlarged 250 times) showing cross-section of rusted metal coated with Rust-Oleum. Geiger Counter readings were taken at each half-mil level down through the rust—tracing Rust-Oleum penetration through rust to bare metal.

Graph (at right) shows Geiger Counter recordings of Rust-Oleum penetration. Visible evidence of Rust-Oleum penetration as recorded by Geiger Counter and Gas Flow Proportional Counter is shown on graph. Rust-Oleum penetration is expressed in terms of "Percentage of Surface Radioactivity" figures at given mil levels. Note how Rust-Oleum pigment and fish oil vehicle combined penetrate to approximately four mils—then the fish oil vehicle penetrates through remaining rust to bare metal.



GET THE COMPLETE STORY. ATTACH TO YOUR BUSINESS LETTERHEAD FOR YOUR COPY OF THIS THIRTY-PAGE REPORT WITHOUT COST OR OBLIGATION.

Rust-Oleum Corporation
2980 Oakton Street, Evanston, Illinois

- ☐ Please send me without cost or obligation, the Rust-Oleum thirty-page report entitled, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings On Steel Specimens," as prepared by Battelle Memorial Institute technologists.
- ☐ Complete literature and color charts.
- ☐ Nearest source of supply.

. . . there is only one Rust-Oleum . . . it is distinctive as your own fingerprint

RUST-OLEUM IS EXCLUSIVE. Most manufacturers of protective materials specify that rusted metal surfaces must be free of rust before applying their product. Rust-Oleum does NOT! With Rust-Oleum you simply scrape and wirebrush to remove rust scale and loose rust —then brush Rust-Oleum 769 Damp-Proof Red Primer directly over the remaining rust. The specially-processed fish oil vehicle penetrates rust to bare metal, merging the rust particles into the coating. It dries to a firm, decorative coating that resists salt water, salt air, heat, fumes, humidity, sun, moisture, and weathering. This unusual penetration saves you time, labor, money, and metal because sandblasting, chemical pre-cleaning, and other costly surface preparations are usually eliminated.

AVAILABLE IN *MANY COLORS.* You beautify as you protect because Rust-Oleum is available in many, many attractive colors including Aluminum, White, Black, Green, Red, Gray, Orange, Yellow, Blue, etc. In addition to industrial rust preventive coatings, Rust-Oleum finish coatings, incorporating the same specially-processed fish oil vehicle, are available (1) to match original equipment manufacturer's colors for farm and road and highway construction equipment, (2) Oil Field finishes to match original equipment colors for rigs, pumps, etc., (3) Restful Colors for plant and institutional interiors, (4) Special Marine and Railroad finishes, (5) Heat Resistant and Chemical Resistant finishes, (6) Masonry and Floor Coatings.

RUST-OLEUM®

Remember—Rust-Oleum's unusual rust-resistant qualities enable you to apply Rust-Oleum 769 Damp-Proof Red Primer one season—and wait until the following season to use your Rust-Oleum finish coating. Thus—you "stretch" maintenance budgets season-to-season.

STOPS RUST!

Write on your business letterhead for your copy of the special Rust-Oleum thirty-page report, entitled, "The Development of a Method to Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings on Steel Specimens." We'll be glad to send it to you promptly, and there is no cost or obligation.

Rust-Oleum Corporation • 2980 Oakton Street • Evanston, Illinois

of the meeting chances looked about 50-50, the final vote was heavily in CC&F's favor. The grst tenant moved into the New England Industrial Center in the fall of 1953. By this time, the firm was working on a package-lease basis for Du Pont at Richmond. Next year, the firm reached further to build a can factory for American Can in Denver.

• **Waltham**—Last spring, Cabot, Cabot & Forbes opened a third district on 128, a 230-acre site at Waltham, starting off with a large lab for Sylvania Electric Products. A fourth district of 122 acres is being opened in the Town of Peabody on the north end of 128. This summer, the firm announced it would develop 300-acre Brainard Field at Hartford, Conn., starting with a $10-million plant for Underwood Corp. It is also scouting locations for new districts in St. Louis and in South Carolina.

• **Competition**—However, the firm also does individual package deals for clients outside of its districts, either for rental or purchase. Blakeley thinks this may eventually develop into the major part of its business. On this, the firm has competition. There are several other developers who make a practice of offering package deals. Also, builders occasionally put together packages from time to time. However, no other firm appears to have reached the point where all the elements of its package is completely under its control.

When the client wants to own the plant, CC&F will be bidding against a combination of the prices to be charged by an architect, an engineering firm, a contractor, and probably other charges such as real-estate brokerage, legal fees, and surveyor's fees. The client will have to compare CC&F's single bid with the total of all the alternative costs. So CC&F would not be bidding directly against a contractor. As a matter of fact, the other contractors' competitive bids might be lower than the element in CC&F's bid that covers cost of construction. But if CC&F's bid were lower than the combined cost of alternate services, the client would presumably accept it.

• **Team set-up**—Once its bid is accepted, here's how CC&F works on an individual plant job:

A team is set up, usually headed by one of the three principals. There is also a contact man, usually a specialist in the most important problem presented by the job, perhaps its financing, perhaps site location. Then there is a follow-up man, who checks the power company and other utilities, studies zoning requirements and many other details. One or two lawyers are also included. They are from an associated law firm, but on salary from CC&F.

Also on the team, of course, are a project manager from the engineering department, probably an assistant project manager, and draftsmen. And a construction superintendent to boss the work.

• **Where the money comes from**—Some clients want to own their buildings, but most deals so far have been on a lease basis. Within a few hundred yards of the firm's office on State Street, plenty of long-term money is flowing through the coffers of life insurance companies and savings banks. If CC&F's client passes the credit test, the property can be mortgaged for a high percentage of value, CC&F retaining an equity. Rental is set at a level that provides interest and amortization during the term of the lease.

The lease may range from 15 to 30 years, depending on the circumstances of the deal. CC&F likes to keep it down to 20 years when possible. When the building is specialized, the lease may be set at 15 years, to write it off as soon as possible. For of course there is always a risk that the tenant may break his lease, leaving CC&F to find a new tenant.

• **Advantages of leasing**—For an industrial company, there are a number of well-known reasons why renting may be better than owning. Instead of making a large initial investment, there is a definite rent cost over a long period. This is a tax-deductible expense, and may be more than the depreciation that could be charged off if the building were owned. In effect, the tenant is borrowing long-term money. But the lease need not show up on his balance sheet.

The lease deal is perhaps not as useful to companies in industries where technology may change rapidly, requiring changes in the plant. In the past, prospects have turned CC&F's bids down for that reason. But the firm can meet this objection by giving an option to buy.

You are going to hear more of Cabot, Cabot & Forbes, and of other firms like it, during the years to come. The pattern they provide fits what Jimmy Durante used to call "the conditions what prevail."

BIG HEAD START
ON DEADLINE WITH
FOSTER
RENTAL
STEEL—SHEET
PILING

Checking Foundations with 120-Ton Load on H-Bearing Frames Anchored to Foster Piling
Hotel - Department Store - Parking Facility
THE DENVER COLORADO PROJECT

Contractors Webb & Knapp got a *Head Start* on this gigantic project by calling Foster for rental steel-sheet Piling, to complete four sumps (that were holding up the major excavation of this 400-foot square foundation). Foster delivered *on time*, the exact sections and exact lengths of steel-sheet Piling needed to get a head start on work schedules.

Foster 12"x 53 lb. H-Bearing Piles driven an average depth of 50 feet, around perimeter of the gigantic 400 foot excavation.

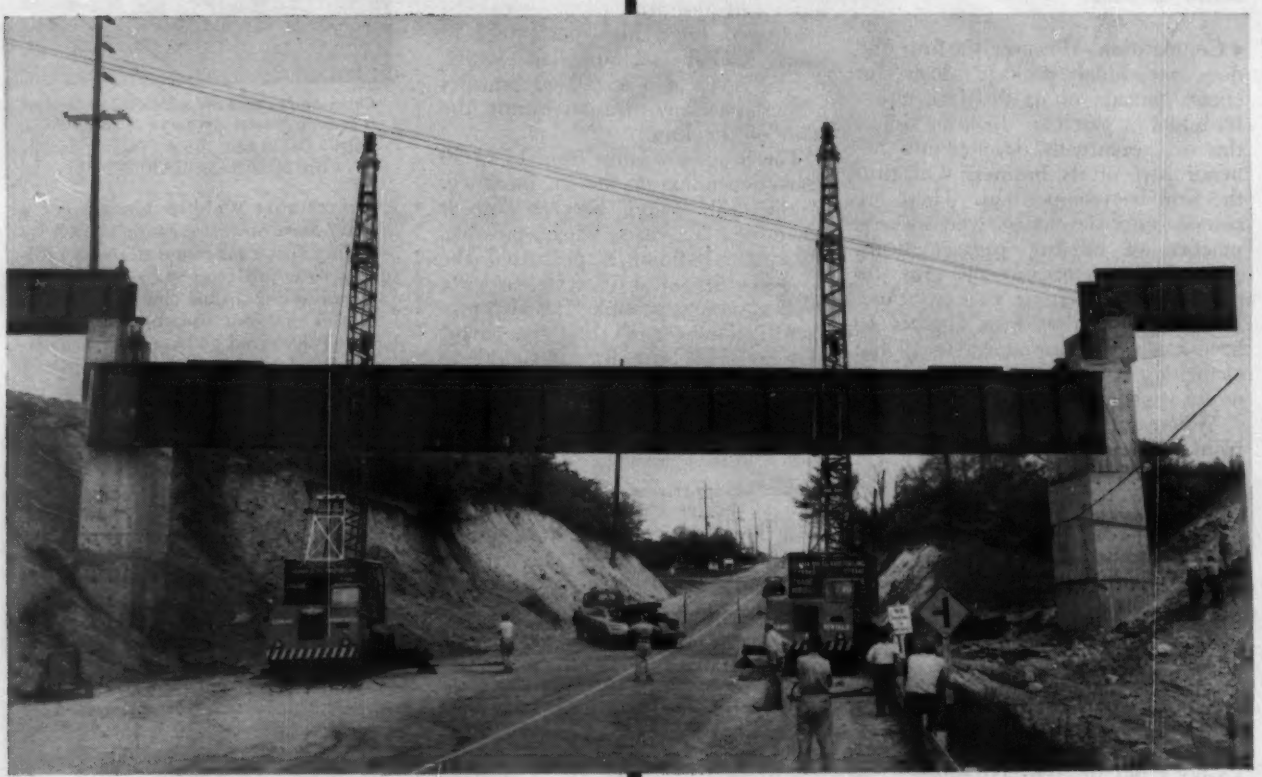
Whatever You Need in Piling
Call L. B. FOSTER for Service
• STEEL-SHEET PILING • H-BEARING PILES
• LIGHTWEIGHT PILING
• PIPE PILES
FASTER from FOSTER
Write for Catalog EP-10

RAILS • TRACK EQUIPMENT • PIPE • FABRICATION
L.B FOSTER co.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

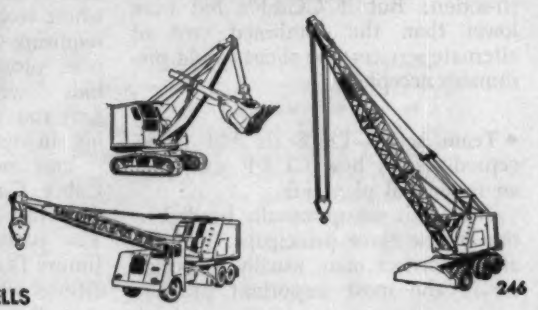
52 ton girders placed in four hour deadline

Just east of Chattanooga the Southern Railway, route of the famous "Chattanooga Choo-Choo", crosses Highway 58, an important link with TVA dams, reservoirs and hydroelectric plants to the north. To erect girders for the new overpass on this well-traveled highway, Atlanta Steel Erectors, Inc., of Atlanta, Georgia, had to work fast because the highway could only be closed to traffic for four hours at a time. But with two 25-ton BAY CITY CraneMobiles employing 55-feet of boom on a twin lift operation, both of the 52-ton, 115-ft. long girders went up on schedule.

One of the girders was hauled from a railroad siding two miles away, and the highway closed to traffic. When the girder was set in place, the highway was reopened while the other girder was brought up. Each operation was completed by the team of CraneMobiles, part of a fleet of four owned by Atlanta Steel Erectors, well within the four hour time limit. Industrial Steel Company was general contractor and steel fabricator on the job. For performance like this on your difficult erection jobs, consult your nearest BAY CITY dealer for complete information on the BAY CITY Cranemobile.



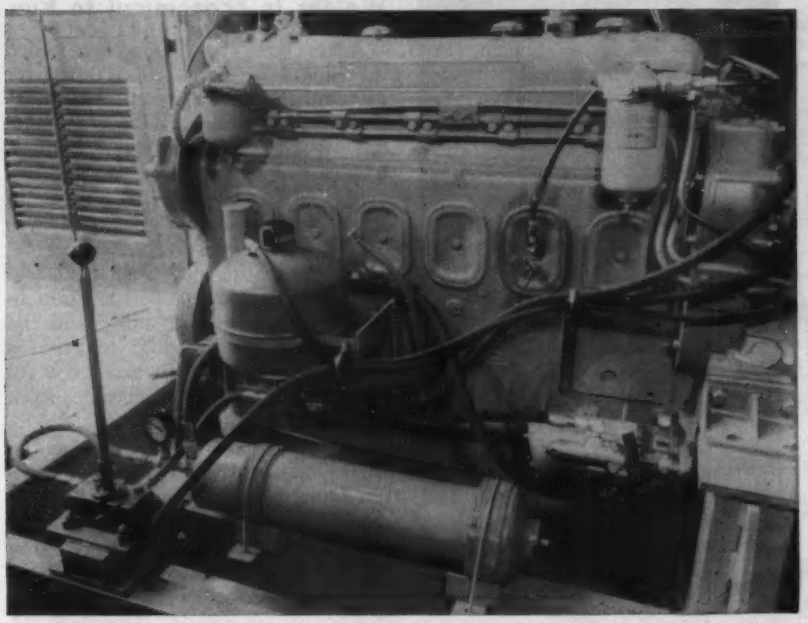
Write for catalogs describing BAY CITY Crawlers of ½ yard and up and BAY CITY CraneMobiles and CraneWagons in capacities to 25 tons.



BAY CITY

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



STARTING SYSTEM has motor geared to flywheel, accumulator and reservoir are shown in center, manual pump is at left. Engine-driven pump usually supplies pressure.

Hydraulics Make Diesel Starting Easy

A new hydraulic starter for diesel engines can eliminate the need for heavy duty electrical systems. The new system consists of a hydraulic motor, a piston type accumulator, an engine driven pump, a reservoir and a manual pump for emergency uses.

In operation, hydraulic pressure is stored in the accumulator by means of a compressed inert gas. Opening a valve permits hydraulic fluid to flow under pressure to the hydraulic or starting motor to kick over the engine. Spent fluid is returned to the system by means of the reservoir. An engine driven pump maintains pressure and the manual pump permits emergency recharging.

Under test conditions at room temperature, as many as 17 starts were made on one accumulator charge; however, temperature is reported to have little effect on the new starter. In laboratory and field tests at sub-freezing temperatures, the hydraulic units are said to have produced high torque and fast acceleration far beyond normal starting speeds in less than a half second.

The starting motor extends slightly more than 9 in. from the engine flywheel housing and can be installed by the average mechanic. It can be coupled to all diesel engines up to 300 hp in the same way as an electric starter.

Positive starter engagement with minimum tooth wear is reportedly assured because the starter control lever mechanically pushes the starter pinion into engagement with the flywheel rig gear before the control valve is fully opened. When a tooth on the flywheel gear is encountered, the control valve permits a small amount of oil flow to turn the pinion slowly until it moves into full engagement. Until the pinion is fully engaged, the control valve cannot be opened to full flow.

Spring action disengages the starter and closes the control valve whenever the lever is released. An overrunning clutch protects the starter against being driven at high speeds before the pinion is disengaged. Allison Div., General Motors Corp. Indianapolis 6, Ind.

Built-in Air Conditioner Removes Condensation Drip

A new type of built-in, wall air-conditioner is said to solve the problem of condensation drip. By means of high humidity overflow design, involving drainage of excess moisture into either the building's heating system of a disposal pipe, condensation disposal is assured in individual units. In addition, efficiency rating for the 1-hp unit is 11,000 Btu's.

Simple installation is made possible by use of a steel sleeve which is part of the conditioner and which is delivered ahead of time to be built into the building wall while the structure is being erected. The unit is slid into the sleeve and connected after the building is completed. Each unit works under its own power and air supply and is independently serviceable.

The conditioner features louvers of anodized aluminum mounted flush with the building exterior. Amic Mfg. Co., Long Island City, N. Y.

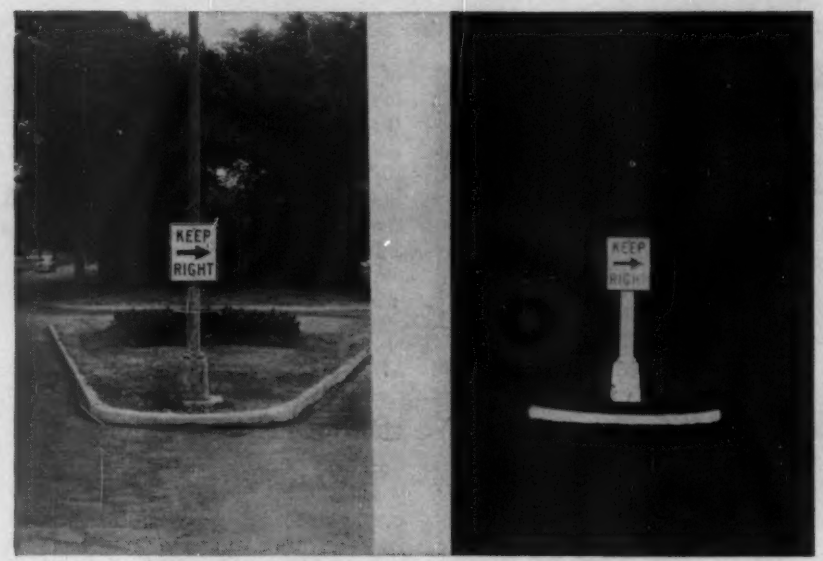
Hardfacing Alloys Can Be Applied From Tube or Jar

Hardfacing pastes have been developed which can be applied without special skill or equipment.

Available in tubes or jars, the new paste reportedly can be used on any metal whose melting point is higher than that of the paste—1850° F. Using gas flame, it can be applied to metal of less than ¼ in. thickness, and with proper induction heating, any thickness of metal can be hardfaced.

A permanent suspension of powdered hardfacing alloy in a water base solution, Hi-C 60 as it is called, can be applied by spatula, brush, or by extrusion from a tube in a layer up to ¼ in. thick. Heating the base metal by flame, or high-frequency induction up to the fusion point of the paste, causes the paste to fuse and bond. The hardness of the treated surface is said to range from 55 to 61 on the Rockwell C Scale. Superweld Corp., 6840 Vineland Ave., N. Hollywood, Calif.

(*New Products continued on page 56*)



REFLECTORIZATION makes signs and obstacles stand out under auto headlights.

Reflective Paint Can Reduce Hazards

Overall reflectorization of traffic hazards and obstructions to make them brightly visible to nighttime motorists is made possible by a new reflective liquid which can be painted or sprayed directly on the surface. It is specifically designed for application to wood, concrete, and other rough or porous surfaces.

Called Codit reflective liquid (No. 7210), it is recommended for reflectorization of median dividers, underpass abutments and walls, culverts, safety islands, curbings, telephone poles, trees, fire hydrants, guard rails and posts and other objects where greater nighttime visibility is necessary for safer driving.

Application is described by the company as easy and economical, even over large areas. For example, the company reports that the entire traffic side of a 4 x 4-ft concrete abutment can be completely reflectorized in less than five minutes at a cost of $1.80. About 15¢ worth of the liquid covers an area of 1 sq ft.

An application will last about one year, the company reports, depending upon the surface to which it is applied and upon the extremes in weather conditions for the area.

The new reflective liquid is light gray in daylight and blends with concrete or other light-colored objects. But at night under auto headlights it reflects back to the driver in bright silver. It is about 50 times brighter than white paint, and a 6 x 8-in. application seen under high beam headlights is identifiable as a hazard about 1,000 ft away.

Codit reflective liquid is sold in 4-lb pails for $5.30 per lb. One such pail will reflectorize more than 140 sq ft of area. DEPT. 5-271G, MINNESOTA MINING AND MFG CO., ST PAUL 6, MINN.

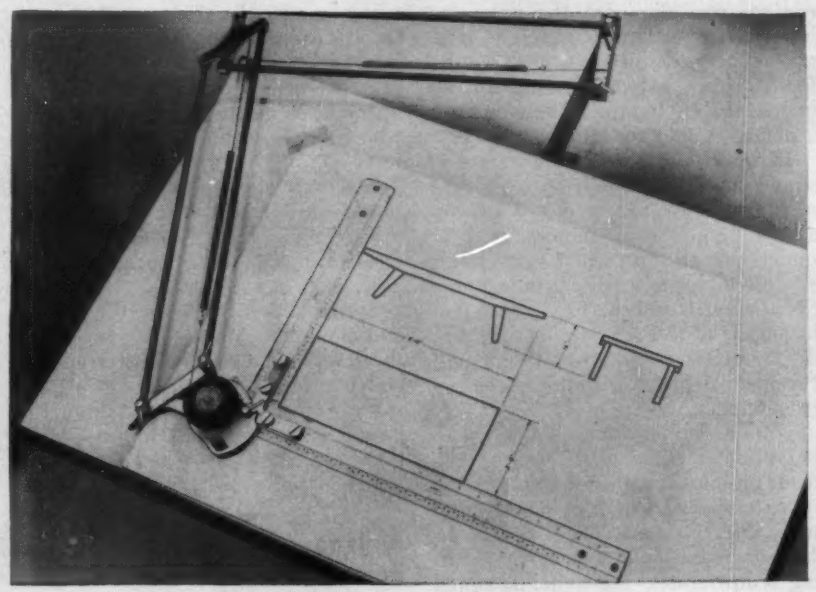
250-Amp Diesel-Powered Welder Is Economical to Run

A new diesel-powered welder, called the Shield-Arc SAE-250, is rated for 250 amp at 40 v, 60% continuous duty cycle. It features diesel-powered welding capacity in a relatively compact, low cost design. It weighs approximately 20 lb less, is 1 ft shorter in length and costs 25% less than a comparable 300-amp welder.

The machine provides regulation of both voltage and amperage throughout the entire output range, and the arc can be controlled as to type as well as intensity. It has a range of 50 to 250 amp, handling electrodes from ⅛ to ¼ in dia.

An improved fuel system of the engine maintains accurate current output both in arc striking and throughout the range of the welder. From no-load to full-rated load, speed variation of the engine is regulated to less than 3½%. This is said to assure good arc striking, uniform penetration in welds, and complete fusion on stringer beads with minimum danger of burn through. The welding generator is

(*Continued on page 58*)



Swedish Drafting Machine Low Priced

A Swedish-made drafting machine is now being offered on the American market at an unusually low price. The instrument is constructed of cold-drawn steel tubing and machined steel and plastic parts. As with other machines, it sets and holds any angle and its complement, combining the functions of T-square, triangle, protractor and scales. The protractor head reads from 90 deg through 0 deg to 45 deg, with an automatic quick-set lock every 15 deg, which takes care of about 90% of all angle work. The head also locks at any desired angle between the 15 deg stops. Lightweight, portable and guaranteed for accuracy and long wear, the Walpole-Nordquist drafting machine, complete with all-purpose or architectural scales, retails for $37.50. The Walpole Company, 419 Boylston St., Boston 16, Mass.

In California ... And the World Over

BUCYRUS-ERIE WARD LEONARD ELECTRIC SHOVELS

Help Put The Lid On Rising Costs

A Bucyrus-Erie 150-B electric shovel loads fill on construction of a new freeway in San Francisco.

In every design and construction feature Bucyrus-Erie Ward Leonard electric shovels are built to save you money. They have the capacity and performance ability to deliver high output at an economical cost per yard.

Modern front-end design eliminates dead weight, lets power work effectively swinging payloads. Boom strength is greatest where it's needed most to withstand digging and swinging stresses. Ward Leonard control results in fast acceleration and deceleration, provides extra torque and ample usable power. Heavy-duty construction keeps maintenance costs down and adds years to machine life.

All over the world — in mines, in quarries, and on big construction projects — Bucyrus-Erie Ward Leonard electric shovels are being used to handle the toughest digging and loading assignments. Those who use them know that Bucyrus-Eries, with their fast operating cycles and durable construction, provide the dependable high-output and low-cost performance that means profitable operation.

58L55

GLOBAL APPROVAL
UNITED STATES • VENEZUELA • ALGERIA • CANADA • CONGO • ENGLAND • FINLAND • FRANCE • INDO-CHINA • MOROCCO • PHILIPPINES • RHODESIA
110-B 4½-cu. yd.
150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

1880 South Milwaukee, Wisconsin 1955

75 Years of Service to Men Who Shape the Earth

Save
with
Permanent
Copperweld
SURVEY
MARKERS

thick copper covering molten welded to steel core

Protect
your investment in the original survey—and protect yourself from troublesome disputes.

At Little Cost
you can quickly and easily drive Copperweld* Survey Markers and have permanent reference points. Bronze head can be center-punched and stamped for identification. If larger head is needed, a 4" adapter is available.

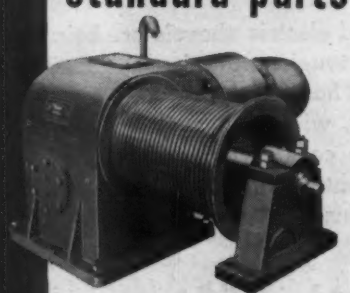
*Trade Mark

Standard length is 3 feet—other sizes made to order. Packed 10 markers to a carton.

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION Glassport, Pa.

Write for Bulletin 144

BUILT TO YOUR needs from standard parts



15-HP SPECIAL PURPOSE HOIST
single fixed drum, worm gear drive

Meet your hoisting needs *precisely* at lowest possible cost. Call on our long experience in modifying and re-combining standard parts to meet specialized hoisting requirements.

Write for bulletins and catalogs

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

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NEW PRODUCTS

equipped with power outlets to provide 115 volts, dc auxiliary power for operating tools and lights.

The welder is powered by a 4-cyl, 4-cycle engine with 166 cu in. displacement, and is rated at 29 hp at 1,700 rpm. It is equipped with a 12-v starting motor and an ether injection system for cold weather starting. THE LINCOLN ELECTRIC CO., CLEVELAND 17, OHIO.

Low-Bed Trailers Designed To Haul Pavers and Rollers

A front-loading low-bed trailer, has been designed especially to facilitate transportation of black top pavers, rollers, etc.

Employing a self-contained power system with a special sheave-type hitch and cable lift arrangement, the Model LXP-14 can be operated behind any standard truck whether or not it has a hoist. A motor-driven hydraulic pump and ram, located underneath the trailer bed, actuates the cable which lowers the trailer platform to a height of 7 in. for loading or unloading over the front end. During this operation, the hoist cable is detached from a dead-end hitch on the rear of the truck and the swivel hitch on the trailer is turned so it lies flat on the ground. Energy for the electric motor is supplied by the towing truck's battery.

The new trailer is available in two models with 8 and 14-ton capacities. The 8-ton unit has an 8 x 13 ft load surface, with four 7:50 x 15 12-ply tires. Weight is approximately 3600 lb. The 14-ton model has an 8 x 16 ft deck, carries four 10:00 x 15 14-ply tires, and weighs around 5500 lb. Both have a platform height of 20 in. LA CROSSE TRAILER CORP., LA CROSSE, WIS.

17-yd Bottom Dump Has Hydraulic Dumping, Steering

A hydraulically operated bottom dump motor wagon, the TW-360, has been added to the Allis-Chalmers line. The 46,000-lb unit is powered by a 280-hp diesel providing, at 2100 rpm, forward speeds ranging from 3 mph in first to 20 mph in fourth gear. Reverse speed of the TW-360 is 3.1 mph.

The wagon, with a 22-ft wheel base, has a 22 cu yd heaped and a 17 cu yd struck capacity, or 26 tons. Its overall length is 35 ft 10¼ in., width is 11 ft 3¾ in., and height is 10 ft 1¼ in.

When loaded, the TW-360 has a 22¼-in. front axle clearance. Its hopper, when empty, has a 31½-in. ground clearance and, when loaded, 29¼ in. Clearance with doors open is reduced to 20½ in.

Operating efficiency and operator comfort is said to be provided by such features as two-speed hydraulic steering, 24-v electric system, four-wheel air brakes, and one-lever control of the doors which retract along the sides of the body for greater ground clearance and wider door openings. Nearly straight wagon sides reduce bridging of the earth.

Selective steering on the TW-360 is provided by a controlled flow system through a single hydraulic valve. Low pump pressure is utilized to give fine control for safe steering on the haul road; full movement of the steering wheel utilizes full pump pressure for easy maneuverability in tough going. ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.

Press for Concrete Testing Can Exert 12-Ton Pressures

A compact hydraulic laboratory press, Model 12-10, has been designed to crush cores or specimens of concrete pavement for determining compressive strength. 12-tons pressure can be exerted by a manually operated hydraulic mechanism.

Platens have a work area of 7 x 10 in. and normal opening is 10 in. high. The opening can be increased, however. Stroke of the hydraulic press is 6 in.

Pressure can be applied slowly or rapidly and released instantly. Precision bored guide holes assure parallel alignment of the platens, and platens which can be heated to 600° F. are standard equipment for applying pressure under elevated temperatures where desired. WABASH METAL PRODUCTS CO., 1604 MORRIS ST., WABASH, IND.

Michigan Tractor-Shovel Gets Turbocharged Diesel

A turbocharged diesel engine rated at 165 hp has been developed for the Michigan Model 175A rubber-tired tractor shovel. The turbocharger uses hot exhaust gases to drive a turbocompressor which pushes air into the cylinders to improve combustion and boost power.

The Model 175A, with 2¼-cu yd bucket capacity and weighing 24,000 lb, has four-wheel drive and rear-wheel steering. The unit has four forward and reverse speeds, with a maximum of 27 miles per hour. CONSTRUCTION MACHINERY DIV., CLARK EQUIPMENT CO., BENTON HARBOR, MICH.

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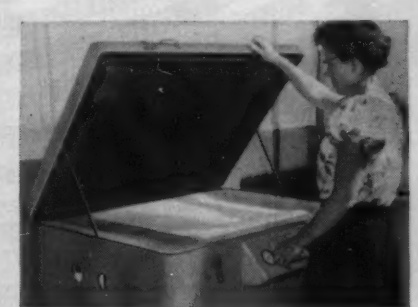

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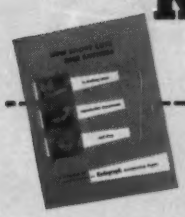

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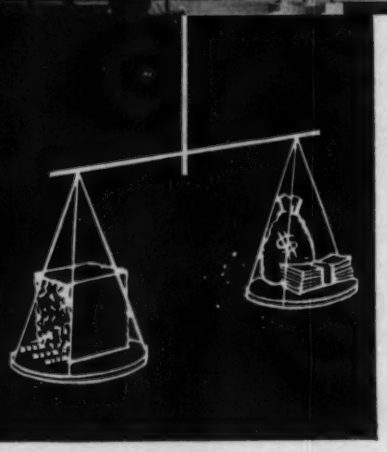

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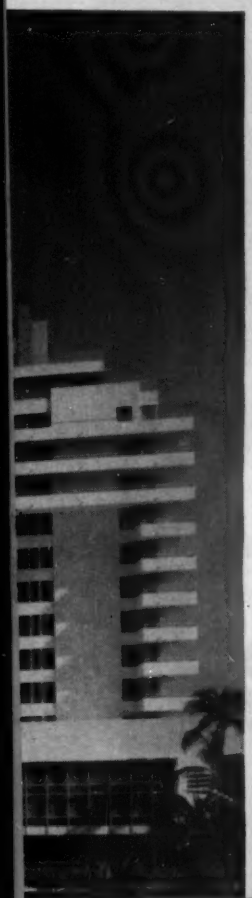

—says Mr. M. Lapidus, architect for the magnificent Fontainebleau Resort Hotel in Miami Beach, Florida, and added:

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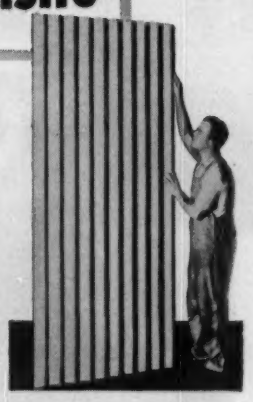

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Messages of praise poured in from such public figures as Herbert Hoover, Vice-President Nixon, California's Governor Knight and Secretary of the Navy Thomas.

Sam Morris, who retired Oct 1 as general manager and chief engineer of the Los Angeles Department of Water and Power, earned these kudos during a distinguished 44-year career in utility operation and education.

A tall, distinguished-appearing man of 65, Morris looks and talks like the dean of engineering he was for eight years. As he enters a productive retirement, Morris can feel his life to date has fitted the definition of success given by another renowned engineer, David Starr Jordan, in an address to Morris' Stanford graduating class in 1911. "Success," Jordan said, "is doing what you want to do and doing it so well the public will compensate you adequately for it."

• **A California product**—Though Morris has an international reputation, his career has been almost entirely a California product.

Born in Los Angeles in 1890, he earned his civil engineering degree at Stanford University, and soon joined the Pasadena Water Department, where he became chief engineer before his 23rd birthday. By 1925 he was general manager, and stayed in that post for 10 years.

While in the Pasadena department, Morris took a major part in creating the metropolitan water district, formed in 1928 to import Colorado River water, and in building a 328-ft high concrete gravity dam to provide storage. Dedicated as the Morris Dam by Herbert Hoover in 1934, it was the sixth highest U. S. concrete dam when built and still ranks among the highest.

• **Educator**—In 1935, Herbert Hoover's brother, Theodore, then Stanford's Dean of Engineering, called Morris back to his alma mater as professor of civil engineering and head of the civil engineering department. The following year he succeeded Hoover as Dean of the School of Engineering.

While at Stanford, Morris kept his hand in municipal utility management as chairman of the Board of Public Works of the City of Palo Alto. He also served as consulting engineer for the East Bay Municipal Utility District in 1937, the Bonneville Power Administration from 1941 to 1944, the City of San Diego in 1943 and 1944, the National Resources Planning Board from 1936 to 1943 and the War Manpower Commission in 1943 and 1944.

• **A challenging job**—In 1944, Morris was offered the top post in the Los Angeles Water and Power Department, succeeding H. A. Van Norman.

Morris accepted, considering the job of managing the nation's largest municipal utility a great challenge. The size of the job is reflected in these figures:

During Morris' 11-year tenure, assets of the department grew from $368,871,000 to $707,000,000, and income from sales of water and power increased from $54 million to $100 million. New construction totalling $500 million was initiated.

Morris feels that a major accomplishment of the department during his tenure was a policy one—securing a charter amendment permitting the department to issue, subject only to certain checks by the mayor and city council, its own revenue bonds rather than relying on general obligation bonds needing voter approval.

That completed the process, says Morris, of putting the department on a straight utility basis, able to perform the long-range planning that a well-run utility must do.

Morris believes that the organization of the Los Angeles department, as originally laid down in 1902, is exemplary among municipalities. It functions essentially as an autonomous organization, with "single-line authority" that makes the general manager and the board of water and power commissioners as responsible for decisions as the officers of a private corporation.

• **His tenets**—As he once told Harold Ickes, during discussions of Ickes' invitation to Morris to head the Bureau of Reclamation, Morris believes that the first requirement in judging the value of public power on any level is that it be efficient and economically sound.

Morris' reputation is probably due in large measure to the fact that such policy matters have interested him as

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much as design work. He doesn't believe in considering engineering as something apart from economic and other management factors. He thinks it's artificial to differentiate between "engineering feasibility" and "economic feasibility." Amplifying this, he maintains that to be sound from a complete engineering point of view, a project must necessarily be sound economically.

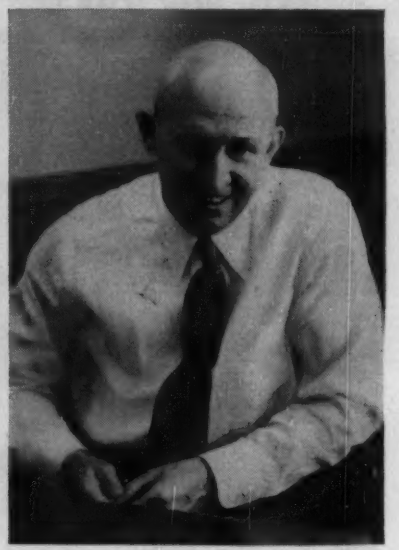
Morris—who has done what he wanted to do to the extent that he's never felt the need of a hobby—feels that utility management is the most satisfying field for an engineer. It combines the chance not only to conceive and design projects but to arrange their financing, construct them, and finally, to operate them.

• **A national figure**—During his 11 years with the department, Morris has by no means restricted his activities to departmental duties. He served as a member of the President's Water Resources Policy Commission and on the committee on Geophysics and Geography of the Research and Development Board. He is a past president of the American Water Works Association, the American Public Power Association, the Los Angeles and San Francisco sections of the American Society of Civil Engineers, and is now a director of ASCE. He was a U. S. delegate to the Geneva Atomic Conference and recently accepted an appointment to a board of consulting engineers advising the government of Israel on water and power.

Though Morris emphasizes that he is retired and has no intention of working so hard as in the past, he will not be inactive. He will continue to serve the department, on something like a half-time basis, as a consultant on Colorado River problems, the Feather River Project, atomic energy, and other matters.

He plans to remain an active member of the advisory panel on general sciences, research and development, Department of Defense; of the Colorado River Board of California; and of the panel on the peaceful uses of atomic energy, at least until the panel makes its report to Congress in January.

Morris' successor as general manager of the Department of Water and Power is William S. Peterson, who had been assistant manager since 1953. Peterson joined the department in 1922 and rose through a succession of posts to chief electrical engineer, top man in the department's power system, before becoming assistant manager.



John P. Riley

Riley to Ibec

Appointed chief engineer of Rockefeller affiliate

Winthrop Rockefeller, chairman of the Ibec Housing Corporation, New York, last week announced appointment of John P. Riley as vice president and chief engineer.

Now director of development for the New York City Housing Authority, Riley will assume his new duties on Jan. 1, 1956.

In accepting Riley's resignation, Philip J. Cruise, authority chairman, said "Few men have contributed more to the success of New York City's public housing program. Since 1939, he has supervised development of more than a billion dollars worth of housing. Methods he introduced which resulted in greater economy and efficiency for us have also had an impact on large scale housing throughout the country."

Headed up by George A. Dudley as president, Ibec Housing is an affiliate of International Basic Economy Corporation, founded by Nelson A. Rockefeller and his brothers in 1947 to promote economic development in various parts of the world through modern technology.

Riley joined the housing authority in 1939 as construction deputy and, after serving as chief engineer, became director of development in 1945.

Under a two-year leave of absence from the authority, he later became coordinator of school construction for New York City's Board of Education (ENR, June 26, 1952, p. 62). Charged with the responsibility of immediately expediting construction

as well as improving its long-range planning, he successfully reorganized the old Bureau of Design and Construction and pushed through a $100-million school construction program.

During this period, Riley also served as civil engineer member of the Projects Installation Committee of the Air Force, appointed to advise on reorganization of the Air Force construction program.

His early career, which began with a civil engineering degree from Cornell University in 1922, included work on hydro-electric and paper mill developments as progress engineer, two years on the Detroit-Canada vehicular tunnel as construction engineer and two years on Upper Mississippi flood control work as field engineer. In 1935, he was named Assistant Deputy Administrator for the National Recovery Administration, supervising construction of rural resettlement projects in 11 northeastern states, and three years later, after working as field engineer on preliminary studies for the Pennsylvania Turnpike, became superintendent of the Department of Housing and Buildings for the Borough of Queens in New York.

The company to which Riley moves in January gets its name from the Ibec method of construction—a mechanized, poured-in-place concrete building method devised by Wallace K. Harrison, chairman of the company's executive committee. Its current project is construction of 1,625 houses in San Juan, Puerto Rico, now being completed as a result of plans made by the Rockefellers with Rexach and Rivera and Corbetta Construction Company, New York construction firms.

Van Til Appointed Manager Of New Trade Association

C. J. Van Til has resigned from the San Francisco staff of the Asphalt Institute to become executive manager of a new trade association known as the Western Asphalt Roofing Manufacturers Association, with headquarters in San Francisco.

A non-profit organization, the association was organized to advance the efficient use of asphalt roofing and asphalt roofing products through education and research. It will be active in 11 western states.

Its new executive manager is a graduate of Purdue University, from which he received a masters degree in civil engineering. He was on the staff of the University of California's Institute of Transportation and Traffic Engineering, before joining the Asphalt Institute.

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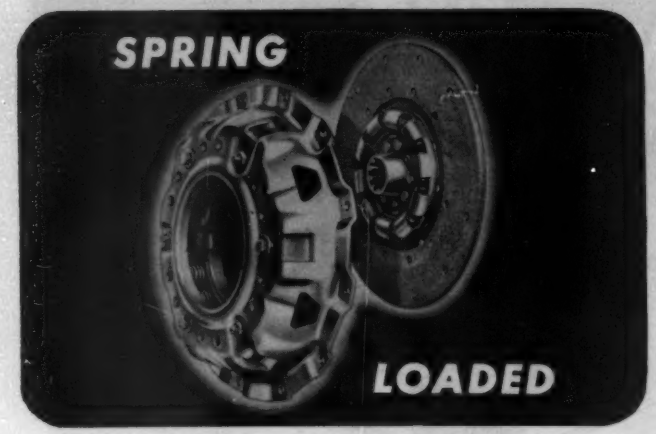

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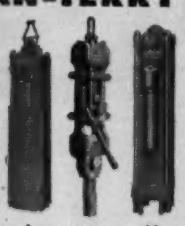

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OBITUARIES

Leon B. Reynolds, 70, emeritus professor of hydraulic and sanitary engineering at Stanford University, died Sept. 26 in Palo Alto, Calif.

Prof. Reynolds attended Hillsdale College and was graduated from Stanford in 1909. Except for graduate work at Cornell (1911-12), he worked continuously from 1909 to 1923 with Burns & McDonnell, consulting engineers of Kansas City, Mo. He became a partner in the firm in 1920. In 1923 he returned to teach at Stanford and remained until retirement in 1950—an inspiration to and confidant of several generations of civil engineering students.

He helped found and served as first president of the California Sewage Works Association in 1928.

J. Edward Settle, 67, president of the Settle Engineering Co., Inc., of Charleston, W. Va., died Sept. 20. His firm at present is engaged in the construction of the new multi-million dollar sewage disposal system and other similar plants throughout Southern West Virginia. A native of Fayetville, he went to Charleston as a consulting engineer in 1927. Settle is a graduate from West Virginia University and Armour Institute of Technology.

Richard C. Pyle, 47, resident engineer of the Denison Dam project, died at Denison, Tex., Sept. 26. The veteran Engineer Corps official had been in charge of the dam since September 1945, only a short time after it was completed. Pyle, who received his engineering degree from Georgia Tech, worked for several civil engineering firms before joining the Corps in 1935 at Vicksburg, Miss. In 1937 he was transferred to Little Rock, Ark., and in 1939 was sent to the Tulsa district office. In December, 1942, he was advanced to the professional engineering division of the Corps.

F. N. Holmquist, first full-time city engineer of Phoenix, Ariz., died at Phoenix, Aug. 27. After graduation from the University of Illinois, he moved to Phoenix in 1909 when the city had a population of 10,000. As a consulting and civil engineer, he was credited with layout of more subdivisions in Central Arizona than anyone else in the area. While most of his time was spent in full-time practice, he also served two years as city engineer, three years as assistant, and was assistant state engineer from 1919 to 1922.

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½-TON PANEL	$18 to $123
¾-TON EXPRESS	$18 to $117
¾-TON STAKE	$39 to $137
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J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

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▲† Massachusetts—BA On Or About 11/1—U. S. Eng., 111 E. 16 St., New York 3, N. Y., Hoosic River Basin, Adams Flood Control Proj., Unit No. 4, Adams, CIVENG-30-075-56-5. $2,000,000-$2,500,000. Plans deposit $25. CD 8/19.

BUILDINGS—BA

▲ Mass., Lunenburg—SCHOOL—BA 10/14—Town, Junior-Senior High School Bldg. Comm., Turnpike Rd., L. O. Griffith, chn., Townsend, 1 and 2 story, Junior-Senior High School, Massachusetts Ave., $1,058,000. Plans deposit $50 refundable. Extended date, Harry J. Korslund, 506 Washington St., Norwood, archt. Goldberg LeMessurier Assoc., 739 Boylston St., Boston, struct. engr. R. J. Vanderweil, 9 Newbury St., Boston, elec. engr. CD 9/27.

HEAVY CONSTRUCTION—LB & CA

▲† The Lane Constr. Corp., 965 Main St., Meriden, Conn. CA $1,422,230, est. $1,500,000. operational parking apron, plane wash disposal plant, Westover Air Force Base, ENG-19-016-56-21, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 9/21, under LB.

▲ CONNECTICUT—State Hy. Comn., State Office Bldg., Hartford,

Conn.—The Savin Constr. Corp., 10 Village St., East Hartford, Conn., LB, $5,006,412. c. conc. Contract No. 1, Greenwich-Killingly Expressway, Milford and Norwalk;

Conn.—L. G. DeFelice & Sons, Inc., Nettleton Ave., North Haven, Conn., LB, $4,728,528, b. conc. Contract No. 1, Greenwich-Killingly Expressway, Milford and Norwalk (13 bidders). Bids Sept. 26. CD 9/15.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ New York—BA 10/18—Bd. Water Supply, 120 Wall St., westerly portion of West Delaware Tunnel of Delaware Tunnel of Delaware System, Contr. 451, 43,000 lin. ft., tunnel, incl. intake channel and Shaft 1 approx. 520 ft. deep located in towns of Tompkins and Hancock, Delaware Co.; Contr. 452, 60,000 lin. ft. tunnel, incl. Shaft 2, approx. 310 ft. deep, Shaft 3, approx. 460 ft. deep, located in towns of Hancock and Colchester, Delaware Co. Plans deposit $5. CD 6/16/44.

BUILDINGS—BA

▲ N. Y., Brooklyn — SCHOOL — BA 10/31 — Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr., plumbing and drainage, heating and ventilating, electrical work, lighting fixtures for new addn., and modernization of existing junior high school 136, Fourth Ave. between 40 and 41 Sts., est. $1,271,900. Plans deposit $20 general constr., $8 plumbing and drainage, $10 heating and ventilating, $10 electrical work and lighting fixtures each. Extended date. CD 9/29.

▲ N. Y., Queens Village—MEDICAL-SURGICAL BLDG.—BA 11/17—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, constr., heating, sanitary, electric, electric elevator, refrigeration and equip. work for medical-surgical bldg., dining and kitchen bldg. and connecting corridors, Creedmoor State Hospital. Plans deposit $50. CD 7/9/53.

HEAVY CONSTRUCTION—LB & CA

▲ P. J. Carlin Constr. Co., Barnaby Concrete Corp., Atlas Tile & Marble Works, 209 W. 38 St., New York, N. Y. LB $1,276,660 (2 bidders) general contract, general superstructure for 74 Street Power Plant, Manhattan Boro, Contr. P-149-1, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Sept. 30. CD 9/14.

▲ William Cassey & Sons, Inc., 2 Lakeview Ave., Lynbrook, N. Y. CA $1,458,515. (9 bidders) Contr. 3A, constr. L. I. Island City intercepting sewers, 43 Ave., 41 Ave., 3 Ave., 37 Ave., Broadway, Vernon Blvd., Main Ave., 30 Ave., Eighth St., Astoria Blvd., First St., 27 Ave., 26 Ave., Third St., Ninth St., Hoyt Ave., South Shore Blvd., 20 Ave. for Bowery Bay Sewage Treatment Works Exten., Queens Boro, NEW YORK. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. CD 9/1, under LB.

▲ Combustion Engineering Co., 200 Madison Ave., New York, N. Y. CA $1,578,660. furnishing, installing one 575,000 lb. per hr. steam boiler for Kent Avenue Power Plant, Brooklyn Boro, Contr. P-121, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn, N. Y. CD 8/5, under LB.

▲ Rao Electrical Equipment Co., Inc., 314 E. 39 St., New York, N. Y., Arc Electrical Constr. Co., Inc., 739 Third Ave., New York, N. Y. and Tully & DiNapoli, Inc., 127-50 Northern Blvd., Corona, N. Y. CA $3,342,590. furnish, install 69 kw. underground transmission sys., 75th St. Sub-station to 128 St., Sub-station, Contr. P-98, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. CD 7/21, under LB.

▲ Verona Contg. Co., Inc., 251½ Grove Ave., Verona, N. J. CA $1,729,030. Contr. 11, 19,000 lin. ft. 7-2 in. rein.-con. pressure pipe, NEW BRUNSWICK, N. J. Middlesex County Sewerage Auth. 103 Bayard St., New Brunswick, N. J. CD 5/26, under LB.

▲ McLean Contg. Co., Fidelity Bldg., Baltimore, Md. LB $6,615,353. Patapsco Tunnel Proj., Contr. PT-118, grading, roadway, substructure for viaduct, Leland Ave. and Clinton St. to Ponca St., incl. ramps; Contr. PT-119, viaduct superstructure for section PT-118, incl. ramps and roadway lighting, MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. Bids Sept. 15. CD 8/23.

BUILDINGS—LB & CA

▲ Estates of Harbour Green, c/o Kern Realty Co., 124-26 Queens Blvd., Kew Gardens, N. Y. Owner Builds, $9,600,000. 400 HOUSES on tract at Bay Drive, near Park Blvd. and Merrick Rd., MASSAPEQUA, N. Y.

▲ Round Lake Knolls Homes, c/o John M. Gabriel, 334 Rte. 17, Paramus, N. J. Owner Builds. $3,600,000. 300 HOUSES on tract on Cromwell Hill Rd., MONROE, N. Y.

▲ Biltman Constr. Co., 101 Park Ave., New York, N. Y. CA Est. $16,500,000. Delano Village, eight 16 story APARTMENTS (3 in first unit), NEW YORK, N. Y. Harlem Estates, Inc., R. Axelrod, pres., 202 Lexington Ave., New York, N. Y. Maxon Sells & Ficke, 33 W. 46 St., New York, N. Y., archts. Biltman & Tschler, 101 Park Ave., New York, N. Y., structural engrs. Charles J. Wurmfeld, 150 Nassau St., New York, N. Y., mech. engr.

▲ Green Grove Estates Homes, c/o Riotto Associates, 713 Teaneck Rd., Teaneck, N. J. Owner Builds, $2,800,000. 200 HOUSES on 82-acre tract on Green Grove Rd. in Neptune Twp., near ASBURY PARK, N. J.

▲ Indian Spring Estates c/o John M. Cullerton, 1207 Springfield Ave., Irvington, N. J. Owner Builds, $4,900,000. 330 HOUSES on 130-acre tract at Cold Indian Spring Road, Wayside, ASBURY PARK, N. J.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

▲ Country Gardens Homes, c/o Halpern Agency, 46 Division St., Somerville, N. J. Owner Builds, $3,000,000. 315 HOUSES on tract on Jackson Ave., MANVILLE, N. J.

▲ Countryside Homes, c/o Brounell & Kramer, 1201 E. Grand St., Elizabeth, N. J. Owner Builds, $2,250,000. 163 HOUSES on tract on New Monmouth Rd. and Route 35, MIDDLETOWN, N. J.

▲ Swimming River Acres, c/o Rudolph L. Novak, archt., 713 Main Ave., Clifton, N. J. Owner Builds, $1,800,000. 104 HOUSES on tract on Hance Ave. between Newman Springs Rd. and Sycamore Ave., NEW SHREWSBURY, N. J.

SOUTH

BUILDINGS—BA

▲ Ga., Milledgeville—HOSPITAL ADDNS.—BA 12/6—Dpt. P. Welfare, State Office Bldg., Atlanta, Powell Building at State Hospital addns., alterations, $1,500,000. Plans deposit $50. Albany Architects & Engineers, 200½ Broad Ave., Albany, archts. Extended date. CD 9/12.

HEAVY CONSTRUCTION—LB & CA

▲ Moss-Thornton Co., Inc., Leeds, Ala., and Cohrce Constr. Co., 356 Cohoron St., Mobile, Ala., LB $1,861,129, est. $2,160,000, paving 18 mi. streets in Crichton area, MOBILE, ALA. City, City Hall, Mobile, Ala. CD 12/20/49.

BUILDINGS—LB & CA

▲ Ebasco Services, Inc., 2 Rector St., New York, N. Y., CA Est. $25,000,000. design and supervise construction, chemical cellulose PLANT, JESUP, GA. Rayonier, Inc., 161 E. 42 St., New York, N. Y.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ Ill., Chicago—BA 10/27—City, City Hall, 68 m.g. reservoir, part of filtration plant at Navy Pier. $4,000,000. CD 1/30/51.

HEAVY CONSTRUCTION—LB & CA

▲ INDIANA—Indiana Toll Road Comn., 309 W. Washington St., Indianapolis, Zone 4,

Union Building & Constr. Co., 631 Main Ave., Passaic, N. J., CA $3,319,560, Contr. C-7, constr. 2.1 mi. sect. of road extending generally between Cline Ave. and Durbin St. in city of Gary. Bids Sept. 14, awarded Sept. 28. CD 9/21 under LB.

BUILDINGS—LB & CA

▲ Kapel Constr. Co., 26330 Lake Shore Blvd., Euclid 23, O., Own Forces., $3,150,000. 175 HOMES development known as Braeburn Park; $1,000,000. 40 HOMES in Sherwood Forest Section, EUCLID, O. CD 8/15.

▲ Gerome & Carpretta Builders, Inc., 1343 Green St., Cleveland, O., Owner Builds, $2,000,000. one hundred 1½ story ranch HOUSES on 65 acre tract off Thornapple Dr., northeast of corner SOM Center and Wilson Mills Rd., MAYFIELD, O.

▲ Tri Modern Builders, 15 W. Busse St., Mount Prospect, Ill. Own Forces, $1,000,000, 56 HOMES and paving, ARLINGTON HEIGHTS, ILL.

▲ J. J. Altman & Co., 2950 Illinois Ave., East St. Louis, Ill., LB $1,959,670, 3 story and ground floor 320x56 ft. and 80x56 ft. brick, steel, rein.-con. HOSPITAL WING, CENTREVILLE TWP. (EAST ST. LOUIS, P. O.) ILL. Centreville Twp. Hospital Bd., Francis Touchette, chn., City Hall, 4831 Bond Ave., Centreville Township, East St. Louis, Ill. Bids Sept. 27. CD 9/14.

▲ Ragner Benson, 4744 Rice St., Chicago 51, Ill., CA, $1,000,000. BANK, CHICAGO, ILL. National Security Bank, 103 W. Chicago Ave., Chicago, Ill.

▲ Citation Builders, 7728 N. Sheridan St., Chicago, Ill., Owner Builds, $1,250,000. 50 HOMES, GLENVIEW, ILL.

▲ Citation Builders, 7728 N. Sheridan St., Chicago, Ill., Own Forces, $1,750,000. 70 HOMES, HIGHLAND PARK, ILL.

▲ Kusehell Realty Co., (agent), 17110 West Seven Mile Rd., Detroit, Mich. Owner Builds. $1,500,000. Canterbury Hills Development, Farm Colonial Homes, 29 HOMES, Hickory Grove, Chickering Court, and Chickering Lane, BLOOMFIELD HILLS, MICH.

▲ Biltmore Constr. Co., 1716 James Couzens Hy., Detroit 35, Mich. CA Est. $3,800,000. Cherry Hill Development, 360 brick HOMES, Cherry Hill and Deering near Inkster Rd., GARDEN CITY, MICH. Hannan Real Estate Exchange, Inc., 16807 Grand River St., Detroit, Mich.

(Continued on page 70)

This JOY CHALLENGER CUT COSTS 49% in an Indiana Quarry

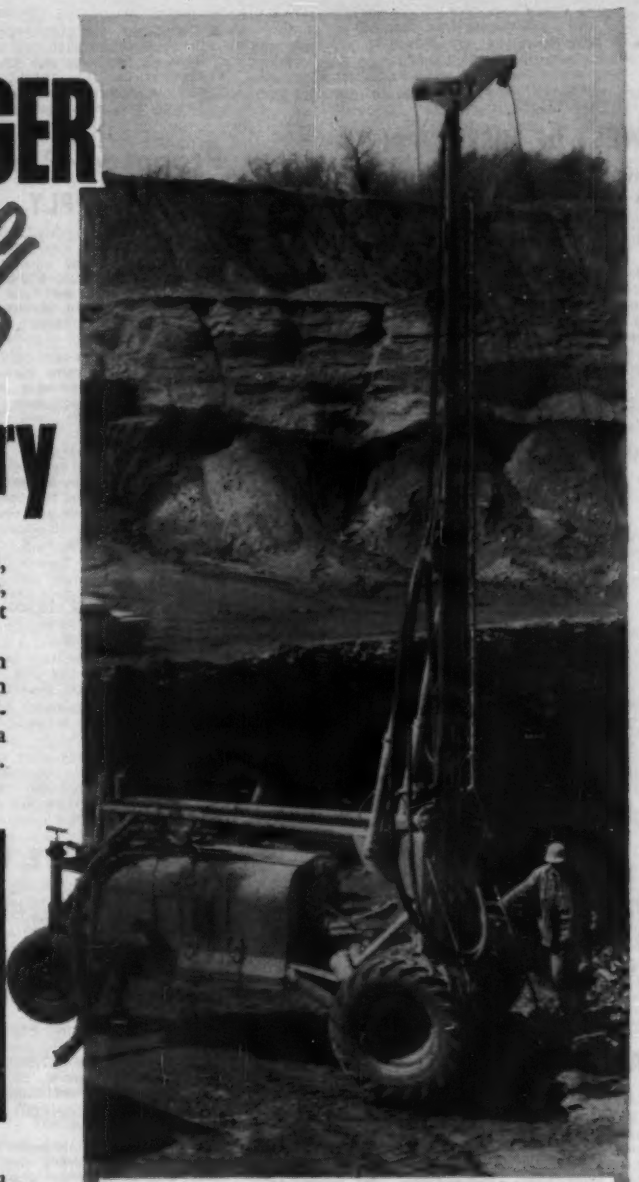
Recently, after installing a Joy "Challenger" drill, management of May Sand & Gravel Co., Fort Wayne, toted up some comparative figures. They found that their drilling costs had been cut almost in *half!*

Previously, with a churn drill, they had been drilling 500 tons of aggregate and road stone in an 8-hour shift at a cost of 11¢ a ton. Now, the Challenger has increased production to 1700 tons a shift, while reducing drilling cost to 5.7¢ a ton. This Challenger figure breaks down as follows:

Bit cost	$ .007	Challenger Model TWM-2
Labor	.014	
Fuel & Lube (incl. comp.)	.007	Depth of Hole.....46 Ft.
Maintenance	.010	Dia. of Hole.....4 In.
Amortization	.019	Drill Pattern 8 Ft. x 10 Ft.
Total	$ .057	

A second advantage in this case has been realized at the crusher plant. The Challenger's faster drilling speed has permitted a reduction of the drilling pattern at little extra cost. Because fragmentation is better, much of the bothersome and expensive secondary shooting has been eliminated. Crusher plant output has increased more than 25%.

In hundreds of mines and quarries and on construction jobs, Joy Challenger drills are breaking records for low-cost blast-hole drilling. Ask for your copy of Bulletin No. 87-U. **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*



The Joy Challenger mounts the largest (5¼") hammer drill made today. It drills up to 4½" dia. holes to fifty feet or more in depth in any type of formation, including hard igneous or metamorphic rock. Available in three models: self-propelled on either gasoline- or air-driven tractor—or in unit form for mounting on your truck or tractor.

Consult a Joy Engineer

For STATIONARY AND PORTABLE COMPRESSORS
ROCK DRILLS • ELECTRICAL CONNECTORS
ROCK BITS • PORTABLE LIGHTING LINES

W&D C-3752

JOY

WORLD'S LARGEST BUILDER OF CORE DRILLS, ROTARY BLAST HOLE DRILLS AND MOTORIZED DRILL RIGS

▲ N. Y., New York—HOUSES—New York City Housing ▲ Mass., Boston—OFFICE, etc.—George Robert White ▲ Tex., San Antonio—DWELLINGS—Hank Kopplow Co.,

(Continued from page 68)

▲ **A & W Homes, Inc.**, 24201 Beverly Ave., Oak Park, Mich. Owner Builds. $1,200,000. 100 brick HOUSES, north of Oak Park Blvd., OAK PARK, MICH. Beneleke & Lorenz, 19740 James Couzens Hy., Detroit, Mich., archts.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—LB & CA

▲ **Continental Oil Co.**, Ponca City, Okla., CA $1,168,874, est. $1,250,000. concession stand on turnpike at Vinita, Craig Co., OKLAHOMA. Oklahoma Turnpike Auth., 321 N.E. 24 St., Oklahoma City, Okla. Bids Sept. 20, awarded Sept. 28. CD 9/26, under LB.;
Phillips Petroleum Co., Bartlesville, Okla., CA $447,000, est. $350,000, concession stand on turnpike at Claremore, Rogers Co. (Oklahoma).

▲ **MONTANA**—State Hy. Comn., Helena,
rejected bids Aug. 30, grade, drain 4.38 mi. Butte West Rd. and Brewery By-pass Butte Rd., Silver Bow Co., LB $873,885. grade, grav., build 25 ft. timber bridge on 4.83 mi. Wilsall Northeast Road, Park Co., LB $141,453; grav. blt. surf. 7.34 mi. Lewistown-Forest Grove Rd., Fergus Co., LB $367,874. Will re-advertise. CD 9/8, under LB.

BUILDINGS—LB & CA

▲ **Natkin & Co.**, 4001 Leavenworth St., Omaha, Neb., CA $1,298,000. mechanicals for Jefferson and Washington HIGH SCHOOLS, CEDAR RAPIDS, IOWA. Independent School Dist., E. W. Lundquist, Dir. of Business Affairs, 346 2 Ave. S.W., Cedar Rapids, Iowa. Bids Aug. 18. CD 8/26 under LB;
Power Engrg. Co., 544 Benson Blvd., Sioux City, Iowa., CA $642,586, electrical (Cedar Rapids, Iowa.).

▲ **A. J. Alport Constr. Co.** 706 Chestnut St., St. Louis 1, Mo. LB $1,269,400. Item No. 1, steam PLANT bldg. No. 401 concrete, steel, asbestos siding, 105x107 ft.; Item No. 2 process incinerator No. 418 incl. connections to stack (subcontract No. WS-11), WELDON SPRINGS, MO. Fruin-Colon Contg. Co. and Utah Constr. Co., joint venturers, St. Louis Area Proj. Contr. AT-(40-1), 1966, P. O. Box 522, St. Charles, Mo. Bids Sept. 27. CD 9/27.

▲ **Centex Constr. Co.**, 4606 Greenville St., Dallas, Tex. Own Forces. $368,100 (E) 33 DWELLINGS; $361,125 (F) 33 DWELLINGS; $410,000 (G) 41 DWELLINGS, DALLAS, TEX. Grand total $1,140,225. CD 3/9.

▲ **Vest & Starkey, Builder**, 9714 Bassoon St., Houston, Tex., CA $360,000, 12 DWELLINGS; CA $381,150, 22 DWELLINGS; $392,000, 28 DWELLINGS, HOUSTON, TEX. Grand total $1,133,150. Vest & Starkey, 9714 Bassoon St., Houston, Tex. CD 5/18.

▲ **The Westbury Co.**, c/o Ira Berne, 802 Franklin St., Houston, Tex. Own Forces. $395,000, 18 DWELLINGS; $380,000, 24 DWELLINGS; $345,900, 12 DWELLINGS, HOUSTON, TEX. Grand total $1,120,000. CD 7/21.

▲ **Ebasco Services**, 2 Rector St., New York, N. Y., CA, $19,000,000. design and construct 100,000 kw. Unit No. 1 new steam POWER PLANT, Cherokee Station, DENVER, COLO. Public Service Co., 15 and Champa Sts., Denver, Colo. CD 12/2.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ **Manson Constr. & Eng. Co.**, 5209 E. Marginal Way, Seattle, Wash. LB $1,937,480 est. $2,584,752 (9 bidders) 4 main piers, Willamette River Bridge at Morrison St., PORTLAND, ORE. Comrs. Multnomah Co., Court House, Portland, Ore. Bids Sept. 29. CD 8/29.

▲ **CALIFORNIA**—San Francisco Bay Toll Crossing, 2054 University Ave., Berkeley,
Erickson, Phillips & Weisberg, 350 Market St., Concord, Calif., LB $1,133,350, paving lower deck of San Rafael-Richmond Bridge, install scaffold rail and hangers, etc., Contra Costa and Marin Counties. Bids Sept. 27. CD 9/2.

▲† **Price McNemmar Co.**, Box 544, Sepulveda, Calif., CA $1,042,082. est. $1,000,000 tactical and administrative facilities, Los Angeles Defense Area. ENG 04-353-56-1, Los Angeles, CALIFORNIA, U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Bids Sept. 20, awarded Sept. 23. CD 9/22 under LB.

▲ **CALIFORNIA**—State Div. Hy.s, 120 S. Spring St., Los Angeles,
Vinnell Co. Inc. & Vinnell Constructors, Box 31, Alhambra, Calif., LB $4,040,882, 2.4 mi. freeway on Golden State Freeway in Cities of Glendale and Burbank, Incl. 9 overcrossings and undercrossings. Los Angeles Co. Bids Sept. 29. CD 9/2.

BUILDINGS—LB & CA

▲ **Heftler Constr. Co. of Calif.**, 332 N. Rodeo Dr., Beverly Hills, Calif. Owner Builds, $1,667,500. 145 frame, stucco DWELLINGS, Fern, Union, Victoria Sts. FULLERTON, CALIF.

CANADA

BUILDINGS—LB & CA

▲ **Paul A. Laurence Co.**, Builders Exchange, Minneapolis, Minn. CA Est. $17,000,000. PLANT expans. incl. wood room addns., new grinder room, modernization of screen room, new chemical pulp facilities, new steam boiler, enlargement of water and electrical supply, KENORA, ONT. Ontario-Minnesota Pulp & Paper Co., 500 Investors Bldg., Minneapolis, Minn. CD 12/28/54.

▲ **Dell Constr. Co. Ltd.**, 2461 Bloor St. W., Toronto, Ont., LB, $1,826,000 (10 bidders) 5 story, bsmnt., U-shaped, two wings each 55x155 ft. adjoining section 42x55 ft. Don JAIL ADDN., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. W., Toronto, Ont. Bids Sept. 27. CD 9/1.

Proposed Projects

WATER SUPPLY

▲ **Ark., Little Rock**—City, City Hall, election Nov. 8, to vote new water rate schedule to provide funds for water reservoir, raw water lines, pumps, generators, filter plant expansion. $10,650,000. Burns & McDonnell Eng. Co., 95 and Toost Sts., Kansas City, Mo., consult. engr. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. on reservoir. CD 12/2/49.

▲ **Colo., Denver**—Denver Bd. Water Comrs., City & County Bldg., enlarging Vasquez Creek collection system, $1,000,000, Alfred J. Ryan, 1340 Glenarm Pl., Denver, consult. engr.-archt.; raising Williams Fork Dam approx. 10 ft., over $44,000. R. J. Tipton Associated Engineers Inc., Insurance Bldg., consult. engr.-archt. CD 8/12.

▲ **New Jersey**—State Water Supply Bd., Dpt. Conservation & Economic Development, 1060 Broad St., Newark, N. J. $100,000,000 bond election Nov. 8, water supply, incl. reservoir at Chimney Rock, Somerset Co. $60,000,000. Tippetts-Abbett-McCarthy-Stratton, 62 W. 47 St., New York, N. Y., consult. engrs. CD 7/29.

▲ **O., Akron**—Comrs. Summit Co., Court House, 209 S. High St., water supply sys. for Springfield Twp. and areas around the Portage Lakes requiring 76 mi. pipe, 2 m.g. standpipe, $2,810,000. Chester Engineers, 210 E. Park Way, Pittsburgh, Pa., consult. engrs. Leslie G. Wolfe, county engr.

▲ **Okla., Chickasha**—City, impounding reservior on Spring Creek and pipe line from reservoir to city. $1,890,000. Woodrow Bowers, city engr.

▲ **Tex., Odessa**—City, water filtration plant. $1,000,000. Parkhill, Smith & Cooper, 201 Avenue R, Lubbock, consult. engrs.

▲ **Utah, Salt Lake City**—Salt Lake City Corp., R. W. McLeese, city engr., City-County Bldg., water treatment plant. $1,900,000. Headman, Ferguson & Carollo, 3308 N. Third St., Phoenix, Ariz. consult. engrs. CD 8/30/54.

SEWERS, WASTE DISPOSAL

▲ **Mich., Van Dyke**—Warren Twp., Arthur Miller, superv., 22720 Van Dyke St., storm and sanitary sewers, lateral and trunk lines, sewage disposal plant, Warren, $10,000,000. Johnson & Anderson, 1307 Pontiac State Bank Bldg., Pontiac, consult engrs. CD 8/30.

▲ **Mo., Springfield**—City, voted $9,900,000 bonds Sept. 13, sewerage modernization, Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago 1, Ill., consult. engrs. CD 9/8.

▲ **N. J., Elizabeth**—City, City Hall, Northwest Storm Water Sewer, Newark St., Route 1, Meadow St., Mary St. and Jackson Ave. $1,500,000. Alexander Potter Associates, consult engrs., 50 Church St., New York, N. Y., made preliminary study. CD 3/31/44.

▲ **N. J., Trenton**—City, City Hall, sewage disposal plant, $4,000,000.

▲ **O., Avon**—Village, interceptor sanitary sewerage sys., incl. trunk lines running east and west in village, pumping stations, sewage disposal plant, $2,220,000. Finkbeiner, Pettis & Strout, 518 Jefferson St., Toledo, consult. engrs.

BRIDGES

▲ **Colo., Denver**—City and Denver Co., City & County Bldg., remodeling 15 St. Viaduct, $1,300,000, Phillips-Carter & Osborn, Insurance Bldg., consult. engrs.-archts.; remodeling 14 St. Viaduct, $1,400,000, Alfred J. Ryan, 1320 Glenarm St., consult. engr.-archt. CD 9/21/51; bridge on California St., $110,000, Ken R. White, 941 E. 17 St., Zone 2, consult. engr.-archt.

STREETS AND ROADS

▲ **OHIO**—State Hy. Dpt., Columbus,
Montgomery Co.—hy. (scheduled for 1957) State Rte. 4 Expressway thru North Dayton, est. $7,162,000, If elevated; if grade based on grade separations at Keowee St. and railroad, Troy, Valley and Findlay Sts., $7,130,000; the grade hy. would have 6 lane and elevated hy. would have 4 lanes. William Ivers & Robert Vogt, 34 W. 6 St., Cincinnati, consult. engrs. CD 12/4/53.

EARTHWORK, WATERWAYS

▲† **Iowa**—U. S. Eng., Clock Tower Bldg., Rock Island, Ill. relocating Johnson County Routes R& I, Stage II, bridge, road surf. and guard rail, $100,000-$1,000,000. Bids about Jan. 12; reconstr. Lake MacBride State Park Dam, earthfill and rock excavation, $100,000-$1,000,000, Bids about Jan. 31; floodwall and utilities relocation, Amana Society Remedial Works, $100,000-$1,000,000, Bids about Feb. 1; relocating Lake MacBride State Park Roads and removing bridge, $100,000-$1,000,000, Bids about Feb. 20, above work at Coralville Reservoir on Iowa River. CD 8/24/54.

▲† **Pennsylvania**—U. S. Eng., Engineer Park, Buffalo, Zone 7, Stage II, constr. seawalls and groins, Presque Isle Peninsula, Erie. $1,000,000-$5,000,000. Bids about September 1955.

AIRPORTS

▲† **Calif., Castle Air Force Base**—PAVEMENT, etc.—U. S. Eng., 74 New Montgomery St., San Francisco, pavement, fuel dispensing, operation, aircraft maintenance, troop housing, facilities, utilities, storage and administration bldg., Castle Air Force Base. $5,550,000.

▲† **Calif., March Air Force Base**—QUARTERS, etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, plans by Wm. Allen, 6112 Wilshire Blvd., Los Angeles, officers quarters, airmens dormitories, dining hall, March Air Force Base, $2,000,000. CD 12/10/52

▲† **Mich., Kinross**—AIRPORT IMPRVS.—U. S. Eng., 600 E. Jefferson St., Detroit, pavements, fuel dispensing, lighting, maintenance, training, facilities, utilities, storage, personnel bldgs. and housing, Kinross Air Force Base. $2,029,000. CD 8/29/51.

▲† **S. C., Myrtle Beach**—AIR FORCE BASE—U. S. Eng., 31 Customhouse, Charleston, Myrtle Beach Air Force Base, pavement, fuel dispensing, facilities, communication and navigation aids, aircraft maintenance, traning, mess hall facilities, utilities, personnel, administrative and community buildings. $6,303,000.

▲† **Tex., Kingsville**—AIR STATION—P. Wks. Officer, Bldg. 1, Naval Air Station, Corpus Christi, Kingsville Air Station, maintenance facilities, operation facilities, navigational aids, storage, maintenance, personnel and community bldgs. $3,686,000.

PUBLIC BUILDINGS

▲ **Ala., Birmingham**—HOUSING—Birmingham Housing Auth., 600 N. 24 St., plans by Charles McCauley, Jackson Bldg., Avondale-Kingston Housing, $7,500,000. CD 7/1.

▲ **Calif., Pittsburg**—SCHOOLS—Pittsburg School District, c/o Supt., Pittsburg, bond election Nov. 29, Junior High School and present schools addns. $5,000,000.

▲ **Colo., Buena Vista**—CELL BLOCKS, etc.—Colorado State Reformatory, Buena Vista, two new cell blocks, vocational training shops addns., new boiler house installations, dining room addn., modernization and expansion of kitchen facilities, schoolroom facilities and chapel, $1,150,000. Jamieson & Williams, 810 12 St., Denver, consult. engrs.-archts.

▲ **Colo., Denver**—POSTAL ANNEX—U. S. Post Office Dept., General Services Admin., 19 and F Sts. N. W., Wash., D. C., 4 story, 100,000 sq. ft. postal annex bldg. $4,000,000. T. H. Buell & Co., 730 14 St., consult. engrs-archts. CD 12/5/49.

▲ **Colo., Lakewood**—SCHOOLS—Jefferson County School District No. 1, Lakewood, bond election Nov. 7, high schools for Lakewood and Wheatridge and addns. to other schools. $7,750,000. T. H. Buell & Co., 714 14 St., Denver, consult. engrs.-archts. CD 9/9.

▲ **Mass., Boston**—SCHOOL—City, Dpt. Schools Bldg., 26 Norman St., plans by Thomas F. McDonough, 25 Huntington Ave., Boston, elementary school, site of Old English High School, Rice, Franklin District. $1,770,000.

▲ **Mich., Royal Oak**—SCHOOL—Royal Oak Twp., Leonard Maker, secy., Lamphere School Bd., John Rd. and 13 Mile Rd., voted $1,000,000 bonds Sept. 20, elementary, school. $500,000. Earl G. Mayers, 806 Farwell Bldg., Detroit, archt. CD 8/4.

▲ **Mich., Wyandotte**—POWER PLANT—City, Municipal Service Comn., J. O. Gartner, pres., 2555 Van Alstyne Blvd., plans by Emery, Marker & Campbell, 1408 Toledo Trust Bldg., Toledo, O., municipal power plant expansion, $4,250,000.

▲ **Minn., Robinsdale**—SCHOOL—Bd. Educ., R. J. Parish, clk., voted $1,500,000 bonds Sept. 20 for constr. equip., site purchase, incl. grade school, $600,000, Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. CD 9/6.

▲† **Mo., St. Louis**—PLANT—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., plans by Russell & Axon, engrs.-archts., 408 Olive St., Zone 2, constr. lead styphnate and tetracene plant for St. Louis Ordnance, vicinity of 4300 Goodfellow Blvd., $1,500,000. CD 9/12.

▲ **N. M., Albuquerque** — GYMNASIUM — Regents University of New Mexico, plans by Meem, Zehner, Holien & Assoc., Box 628, Santa Fe, gymnasium, incl. courts, swimming pool, parking. $1,650,000.

▲ **N. J., Trenton**—VOCATIONAL SCHOOL—Bd. Educ., 9 S. Stockton St., plans by Micklewright & Mountford, 72 Ewing St., vocational school. $1,500,000. CD 1/6/47.

▲ **N. J., Trenton**—SCHOOL—Hamilton Twp. Bd. Educ., 2069 Greenwood Ave., plans by Hankin Stull & Backes, 495 W. Hanover St., Senior High School, S. Clinton and Park Aves. $3,200,000.

▲ **N. Y., New York**—POLICE ACADEMY—Dpt. P. Wks., Municipal Bldg., Zone 7, police academy on north side of 20 St., east of Third Ave. for Police Dpt., Proj. PO-77. $4,458,000. Site changed. CD 2/28.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Brown & Guenther, 1860 Broadway, Zone 23, 3 story Junior High School, 139, 149 East 142 St. $2,840,000. CD 1/20/55.

▲ **N. Y., New York**—HOUSES—New York City Housing Auth., 299 Broadway, Zone 7, Forest Houses South (city) for 300 apartments on site bounded by E. 163 St., Trinity Ave. and E. 161 St., Proj. NYC-30. $4,800,000.

▲ **Pa., Houston** — SCHOOL — Charters Houston Joint School District, Houston, plans by Kuhn & Newcomer, 470 Washington Rd., Mt. Lebanon, Pittsburgh, Pa., Junior-Senior High School addn., $1,160,000.

▲ **Tenn., Nashville**—DORMITORY—State Dpt. Mental Health, Capitol Bldg., 200-patient dormitory on Clover Bottom Farm for the Feeble-Minded. $1,250,000.

▲ **Tex., Amarillo** — SCHOOL — Amarillo Independent School Dist., Amarillo, plans by Bob Hucker, Johnson Bldg., Senior High School, $1,450,000; plans by Emmett F. & Jas. F. Rittenberry, Fisk M & P Bldg., Junior High School addn., $350,000; plans by Howard Ensign, 1312 W. 15 St., Junior High School, $1,225,000. CD 3/8.

▲ **Tex., Austin**—WARD UNITS, etc.—Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., plans by Walter C. Moore, owners superv. archt., ward units, 450-bed capacity, $1,170,000; ward units, 300-bed capacity for mentally retarded, $780,000 both at Austin State Hospital; laundry-administration, State School Farm Colony, $100,000. CD 10/2/52.

▲† **Tex., Fort Bliss**—SCHOOL, etc.—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., artillery school, housing, community, training and administrative buildings, operation and maintenance facilities, $4,645,000.

▲ **Tex., Irving**—SCHOOLS—Irving Independent School Dist., Irving, voted bonds Sept. 24, high school, $725,000; Junior High School unit, $375,000; Elementary School No. 2, $350,000; Elementary School No. 1, $350,000. CD 9/15.

▲ **Tex., Mexia**—HOSPITAL UNITS, etc.—Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., Austin, plans by Walter C. Moore, supvr. archt., c/o owner, hospital ward units, $1,560,000; 60-70 bed capacity hospital units, $350,000, at Mexia State Hospital. CD 12/14/51.

▲ **Tex., San Antonio**—WARD UNITS—Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., Austin, plans by Walter C. Moore, c/o owner, supervs. archt., ward units, San Antonio State Hospital. $1,170,000. CD 1/23/50.

▲ **Tex., San Antonio**—SCHOOLS—Alamo Heights Independent School Dist., 150 E. Fair Oaks St., bond election Oct. 29, Howard Elementary School expansion, $500,000; Senior High School addns., $500,000. CD 3/2.

▲ **Tex., Wichita Falls**—MEDICAL TREATMENT UNITS—Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., Austin, plans by Walter C. Moore, supervs. archt., c/o owner, medical treatment units, Wichita Falls State Hospital. $1,000,000. CD 12/28/50.

▲ **Wash., Tieton**—SCHOOLS—Highland School Dist. 203, E. Tieton, 2 elementary schools. $500,000 each.

▲ **Wis., Appleton**—HOSPITAL—Outagamie Co., Appleton, plans by Geo. Narovec, 520 E. Wisconsin Ave., 4 story, 126,200 sq. ft. hospital. $2,000,000.

▲ **Wis., West Bend**—GYMNASIUM, etc.—Bd. Educ., West Bend, gymnasium, auditorium and pool addn. to high school. $1,300,000. CD 8/4/52.

▲ **Alta., Calgary**—HOSPITAL—Calgary General Hospital, Calgary, plans by Stevenson & Dewar, 340 7 Ave. W., 6 story and 2 story hospital addns. $1,000,000. CD 1/28/53.

▲ **Ont., Ottawa**—FEDERAL—Dpt. P. Wks., Hunter Bldg., plans by E. A. Gardner, c/o owner, 8 story geological-geographical surveys federal building, southwest section of city. $1,500,000.

▲ **Ont., Toronto**—HOSPITAL—Toronto East General Hospital, Coxwell St., 2 hospital wings, $1,600,000; internes' residence and laundry, $515,000; nurses residence. $375,000.

COMMERCIAL BUILDINGS

▲ **Calif., Hayward**—SHOPPING CENTER—Stoneson Development Corp., 3150 20 Ave., San Francisco, shopping center, 1,000 car parking area, office bldgs., professional bldgs., department store, market bldg. and restaurant, $1,000,000.

▲ **Calif., Red Bluff**—HOMES, etc.—Ronayne Sales & Development, Inc., Concord, and Hancock Constr. Co., Lafayette, 300-home subdivision and shopping center, $7,000,000-$7,500,000.

▲ **Calif., Sacramento**—DWELLINGS—Artz, Carlson & Ellis, 1921 Stockton Blvd., 143 dwellings in Oakmont Terrace at 64 Ave. and 14 St. $1,859,000. Joseph E. Spink, Calif. Fruit Bldg., consult. engr.

▲ **Calif., Sacramento** — DWELLINGS — Parkway Investment Co., 4701G Parkway, 121 dwellings in Golf Course Terrace No. 16 Subdivision. $1,815,000. Joseph E. Spink, Calif. Fruit Bldg., consult. engr.

▲ **Conn., New Haven**—ELECTRICAL ENGINEERING LABORATORY—Yale University Bd. Trustees, New Haven, plans by Douglas Orr & Paul Schweikher, 111 Whitney Ave., electrical engineering laboratory, 4 Hillhouse Ave. $1,000,000. CD 11/16.

▲ **Del., Wilmington**—HOSPITAL ADDNS., etc.—Wilmington General Hospital, Broom and Linden Sts., plans by G. Morris Whiteside, 2nd, Wm. G. Moeckel and Joseph E. Carbonnell, Jr., 909 Tatnall St., hospital addns., alterations. $3,800,000.

▲ **Kan., Atchison**—DORMITORY—Mount St. Scholastica College, Atchison, plans by Maguolo & Quick, 4908 Delmar St., St. Louis, Mo., girl's dormitory, $1,000,000. student activity bldg., $1,000,000.

▲ **Mass., Boston**—OFFICE, etc.—George Robert White Fund, City Hall, plans by Thomas F. McDonough, 25 Huntington Ave., 6 story, office and stores, 478-488 Boylston St. between Berkley and Clarendon Sts. $1,000,000. CD 5/4.

▲ **Mo., Springfield**—HEADQUARTERS—General Council of Assemblies of God, 434 W. Pacific St., national headquarters bldg, $3,000,000.

▲ **N. Y., New York**—APARTMENT—165 Realty Ltd., 80 Broad St., Zone 4, plans by Kokkins & Lyras, 660 Madison Ave., Zone 21, apartment, 1130-48 Third Ave. $2,000,000.

▲ **N. Y., New York**—CHURCH—Church of Our Saviour, 65 Park Ave., plans by Paul Reilly, 111 Fifth Ave., church, Park Ave. and 38 St. $1,000,000. CD 1/14/55.

▲ **N. Y., Rockaway Beach**—HOSPITAL—Rockaway Beach Hospital, Beach 85 St., hospital, 6-acre tract, Beach Channel Dr. from Beach 50 to Beach 53 St. $3,000,000.

▲ **O., Akron**—SHOPPING CENTER—Earle Lipchin Organization, Inc., 526 St. Paul St., Baltimore, Md., shopping center on 20 acre site along Kent Rd., opposite Silver Lake, near here. $1,200,000.

▲ **O., Beachwood Village**—APARTMENT—L. M. Gunderson, 13124 Shaker Square, Cleveland, Zone 20, plans by George Burroughs, Howard, Hinman & Gabriel, 16104 Kinsman Rd., Cleveland, Zone 20, 4 bldg., 70-suite apartment proj. on site on Green Rd., north of Kinsman Rd. $1,000,000. Subject to zoning changes being secured.

▲ **O., Cleveland**—HOSPITAL—Mt. Sinai Hospital, M. E. Glass, pres. of Bd., 1800 E. 105 St., Zone 6, plans by Dalton & Dalton, Old Arcade, Zone 14, hospital. $5,000,000.

▲ **O., Cleveland**—Y.W.C.A. BLDGS.—Young Women's Christian Assn., 1710 Prospect Ave., Zone 15, plans by C. E. McBurney, 19 LaSalle St., Chicago, Ill., Y.W.C.A. Central Bldg. and metropolitan offices, $1,500,000; Y.W.C.A. branch in Brooklyn area, $335,000; Y.W.C.A. east side branch, $335,000.

▲ **O., Dayton**—HOMES—Glenn R. Smith & Assoc., Winters Bank Bldg., 50 to 60 homes, Whipp Rd. and Lebanon Pike, Washington Twp. $1,000,000. Construction in 1956.

▲ **Tex., Austin** — DWELLINGS — Builders Development Corp., c/o S. R. Sheppard, Littlefield Bldg., 30 dwellings, $349,150; 26 dwellings, $350,000; 32 dwellings, $386,225; 9 all-masonry dwellings, $360,000; 10 all-masonry dwellings, $390,125; 28 dwellings, $369,265; 12 all-masonry dwellings, $371,000.

▲ **Tex., Balch Springs**—DWELLINGS—Jacoby & Burk Brothers, Balch Springs, Group 8, 36 dwellings, $396,200; Group 9, 25 dwellings, $360,175; Group 10, 31 dwellings, $380,060; Group 11, 28 dwellings, $371,050; Group 12, 33 dwellings, $371,000; Group 13, 20 dwellings, $345,750 on old "Diamond D" Ranch property.

▲ **Tex., Dallas**—DWELLINGS—Vernon & James Smith Co., 2151 Fort Worth Ave., 4 dwellings, $355,000; 12 DWELLINGS, $375,000; 10 DWELLINGS, $379,500; 7 DWELLINGS, $369,750, in Kessler Lake Estates.

▲ **Tex., El Paso**—BANK—Federal Reserve Bank of Dallas, 400 S. Akard St., Dallas, plans by Davis & Foster, Mills Bldg., federal reserve bank. $1,000,000. CD 12/10.

▲ **Tex., El Paso**—SHOPPING CENTER—Owners, c/o J. Ted Cottle, 112 N. Stanton St., shopping center, 22-acre site, near Hy. 80. $3,250,000.

▲ **Tex., Farmers Branch**—DWELLINGS—Shiloh Terrace Corp., Farmers Branch, 24 dwellings, $370,700; 28 dwellings, $380,110; 20 dwellings, $365,500; 31 dwellings, $394,625; 19 dwellings, $350,000, in sect. Valwood Park.

▲ **Tex., Houston**—DWELLINGS—Briargrove Lane Co., c/o R. L. Phillips, Almeda-Genoa Rds., 22 dwellings, $419,000; 20 dwellings, $392,500; 10 dwellings, $350,000; 15 dwellings, $370,610; 12 dwellings, $368,405; 14 dwellings, $365,000, adjacent to Briargrove Addn.

▲ **Tex., Houston**—DWELLINGS—Dan McCrary & Assocs., Rusk Bldg., plans by Dunaway & Jones, 2425 Ralph St., 25 dwellings $355,000; 30 dwellings, $377,215; 28 dwellings, $368,200; 35 dwellings, $386,245; 31 dwellings, $381,500, in Woodshire's 4th Sect.

▲ **Tex., Houston**—DWELLINGS—Memorial Forest, c/o Robert P. Puig & H. W. Edmunds, Villanova St., 9 dwellings, $348,000; 17 dwellings, $379,910; 12 dwellings, $365,000; 15 dwellings, $373,335, in "Memorial Forest".

▲ **Tex., Mesquite**—DWELLINGS—Riggs & Majors, 207 S. Rugel St., 18 dwellings, $390,000; 14 dwellings, $371,625; 9 dwellings, $348,000; 12 dwellings, $366,500; 21 dwellings, $410,775; 16 dwellings, $382,190, addnl. constr. Southside.

▲ **Tex., Orange** — DWELLINGS — Morris Coon, Homebuilder, Pasadena and Orange, Tex. 27 dwellings, $374,645; 25 dwellings, $366,735; 30 dwellings, $360,000; 22 masonry dwellings, $352,500, Sect. 3 Greenway Manor.

▲ **Tex., Orange**—DWELLINGS—Morris Coon, Homebuilder, Pasadena and Orange, 38 frame dwellings, $380,000; 35 frame dwellings, $350,000; 33 frame dwellings, $372,100; 30 frame dwellings, $366,500; 28 frame dwellings, $355,000, Sect. 2 of Greenway Park.

▲ **Tex., San Antonio**—DWELLINGS—Bellaire Lumber Co., 7903 S. Flores St., 30 dwellings $350,000; 32 dwellings, $363,000; 35 dwellings, $371,000, on Northside.

▲ **Tex., San Antonio**—DWELLINGS—Hank Kopplow Co., 7902 S. Flores St., 28 dwellings, $376,225; 35 dwellings, $398,500; 33 dwellings, $391,125; 31 dwellings, $385,000; 20 dwellings, $368,500 17 dwellings, $350,000, in East Terrell Hills area.

▲ **Tex., San Antonio**—DWELLINGS—Jaffe & Martin, 4623 Blanco Rd., 40 frame dwellings, $360,000; 35 frame dwellings, $355,500; 38 frame dwellings, $371,715. in "Brady Gardens".

▲ **Tex., San Antonio**—HOSPITAL—Texas Chiropractic College 618 W. Myrtle St., 7 story, 250-bed hospital; 2 story college bldg. $1,000,000.

▲ **Tex., San Antonio**—DWELLINGS—Van Der Heck Eng. Co., 2310 Gollad Rd., 32 dwellings, $369,200; 27 dwellings, $350,515; 35 dwellings, $374,120 in "Highland Hills".

▲ **Ont. Toronto**—HOTEL—National Management Ltd., 620 Cathcart St., Montreal, Que., plans by Henry Langston, 1375 Green Ave., Montreal, Que., 18 story, 900-room Lord Simcoe Hotel. $9,500,000. CD 9/28.

▲ **Ont., Toronto**—OFFICE—Ridout Real Estate Ltd., 46 Bloor St. W., plans by C. B. Dolphin, 880 Bay St., 15 story office, 68 Bloor St. E., with heliport on roof. $6,000,000.

▲ **Ont., Toronto**—OFFICE UNITS—Owner c/o E. I. Richmond, archt., 455 Spadina Ave., 3 separate office units, two 30,000 sq. ft. and one 50,000 sq. ft., each 5 stories. $1,500,000. CD 1/19.

▲ **Ont., Toronto** — OFFICE, etc. — M. Starkman, c/o Blake H. M. Tedman, archt., 623 Sherbourne St., 9 story office bldg. and 50-car parking garage, University and Wellington Sts. $2,100,000.

▲ **Que., Cap de la Madeline**—HOUSING—Phil Blouin, Blvd. Pie IX, Cap de la Madeline, 150-cottage housing program, $1,000,000.

INDUSTRIAL BUILDINGS

▲ **Ala., Gorgas**—STEAM GENERATING PLANT—Alabama Power Co., 600 N. 18 St., Birmingham, steam generating plant. $24,000,000. Construction late 1955 or early 1956. CD 11/8/52.

▲ **Ill., Niles**—FACTORY—Imperial Brass Co., 1200 W. Harrison St., Chicago, plans by Shaw, Metz & Dolio, 208 S. La Salle St., Chicago, Zone 4, 1 and 2 story factory, Howard Ave. east of Caldwell Rd. $1,500,000.

▲ **Ind., Fort Wayne**—WAREHOUSE—W. T. Grant Co., 130 W. 42 St., New York, N. Y., 1 story, 250x400 ft., brick, steel warehouse, W. State St. west of Pennsylvania R.R's. G.R. and I. facilities with direct rail access to building, off-street parking, etc. $1,000,000.

▲ **Ind., Indianapolis** — SHOP, etc. — General Motors Corp., (a Delaware Corp.) P. O. Box 894, plans by Argonaut Realty Co., 485 W. Milwaukee Ave., Detroit 2, Mich., 424x463 ft., steel, masonry, rein.-con. model shop and assembly plant outside city limits. $1,000,000.

▲ **Iowa, Des Moines**—PLANT—Penn Dixie Cement Corp., 60 E. 42 St., New York, N. Y., plant addn., installing new kiln, machinery and dust precipitators at West Des Moines, $4,500,000.

▲ **Mich., Flint**—PLANT—General Motors Corp., AC Spark Plug Div., General Motors Bldg., Detroit, plans by Argonaut Realty Div. General Motors Corp., General Motors Bldg., Detroit, mfg. plant, Dort Hy. $3,000,000.

▲ **N. J., Penns Grove**—GENERATING UNIT—Bd. Directors Atlantic City Electric Co., Kentucky and Pacific Aves., addnl. 75,000-kilowatt turbo-generating unit, Deepwater Generating Station, Total est. $18,000,000. Gibbs & Hill, Pennsylvania Station, New York, N. Y., consult. engrs. CD 9/17/54, under N. J., Atlantic City.

▲ **N. Y., New York**—GARAGE—Gulf Oil Co., Gulf Bldg., Pittsburgh, Pa., 3 story parking garage, East River and 23 St. $1,000,000. Elpel Engineering Co., 101 Park Ave., Zone 17, consult. engr. CD 9/9.

▲ **O., Cincinnatti**—PLANT—Red Top Brewing Co., 1747 Central Ave., plant alteration $1,000 000.

▲ **O., Cleveland**—DISTRIBUTION CENTER—Western Electric Co., Inc., 195 Broadway, New York, N. Y., 425x602 with mezzanine 177x425 ft., brick front distribution center, 30-acre site near Auorra and SOM center Rds., Solon, $5,000,000. CD 6/30/53.

▲ **Tenn., Cleveland**—PLANT—Peerless Woolen Mills, Rossville, Ga., 250,000 sq. ft. brick, steel, concrete textile plant. $2,500,000.

▲ **Sask., Beaverlodge**—MILL—Lorado Uranium Mines Ltd., 171 Yonge St., Toronto, Ont., 750 to 1,000-ton uranium ore mill. $7,000,000-$8,000,000.

▲ **Sask., Prince Albert**—PLANT—Burns & Co. Ltd., 15 St. and 6 Ave. E., plant reconstr. $5,000,000.

UNCLASSIFIED

▲ **Kentucky, Ohio, Louisiana**—MAIN LINE LOOPS—Tennessee Gas Transmission Co., Commerce Bldg., Houston, Tex. 220 mi. 26 and 30 in. main line loops in Kentucky and Ohio, with compressor facilities, 376 mi. into southeastern Louisiana. $56,011,000. FPC authorized project.

▲ **Mo., St. Louis**—STREET LIGHTING—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., Zone 3, constr., installation street lighting on 22½ mi. city streets, $1,160,000. Sverdrup & Parcel, Inc., Syndicate Trust Bldg., 917 Olive St., Zone 1, consult. engr. CD 7/21.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
J. F. White Constr. Co., 201 Alewife Brook Parkway, Cambridge, Mass. CA **$1,533,404.** est. $1,500,000. hy. and bridge constr. (Southern Circumferential Hy.), U 229 (10), Canton. CD 9/23, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
A. V. Taurasi Co., Inc., 139 Jaques St., Somerville, Mass. LB **$2,286,663.** Amvets Memorial Hy., Fall River. Bids Oct. 4. CD 9/15.

▲ **V. Barletta Co.**, 10 Whipple Ave., Boston, Mass. LB **$13,583,490.** Contr. KL, tunnel north approach John F. Fitzgerald Expressway, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Bids Oct. 4. CD 9/26.

BUILDINGS—LB & CA

▲ **Consolidated Constructors, Inc.**, 807 Congress St., Portland, Me. LB **$1,432,200.** SCHOOL for the Deaf, Falmouth Forside, Mackworth Island, PORTLAND, ME. State, Dpt. Institutional Service, State House, Augusta, Me. Bids Oct. 5. CD 9/31.

M. S. Kelliher Co., 294 Washington St., Boston, Mass. CA Approx. **$900,000.** parochial SCHOOL, 91 Gordon Ave., 11 Hale St., HYDE PARK, MASS. Our Lady of Czenstochowa, 17 Hale St., Hyde Park, Mass. Chester F. Wright, 681 Main St., Waltham, archt.

▲ **L. & R. Constr. of Medford, Inc.**, 36 Earl Ave., Medford, Mass. LB **$1,076,150.** est. $958,400. M-614 Building for disturbed females, State HOSPITAL, MONSON, MASS. Commonwealth of Mass., Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Sept. 30. CD 9/13.

S. & A. Allen Constr. Co., Inc., 9 Newbury St., Boston, Mass. CA Approx. **$948,000,** est. $1,000,000. HEALTH CENTER, Florence St., NEWTON, MASS. Suburban Sidney Hill, Inc., 1 Court St., Boston, Mass. CD 9/8, under LB.

▲ **Westover Crescent Park**, c/o Frank T. Slavin, 162 Bedford St., Stamford, Conn., Owner Builds. **$1,400,000.** 41 HOUSES near Valley Rd. between Cognewaugh Rd. and the Niamus River, COS COB, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **N. Y., Brooklyn**—BA 10/19—Dpt. P. Wks., Municipal Bldg., New York. Zone 7, Contr. 6, structures and equipment, Contr. 7 electrical, Contr. 8 heating and ventilating, Contr. 9 plumbing for Greenpoint Interceptor. Plans deposit $100. Extended date. CD 9/26.

BUILDINGS—BA

▲ **Md., Baltimore**—SCHOOL—BA 10/19—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, masonry Gwynn's Falls Parkway Elementary School, $1,500,000. Plans deposit $50. Edw. H. Glidden, Jr., 414 Equitable Bldg., Zone 2, archt. CD 4/1/52.

▲ **Pa., Pittsburgh**—SCHOOL—BA 10/27—School Dist. of Wilkins Twp., 2430 Greensburg Pike, 1 story, brick, steel junior high school addn., $1,200,000. Hunter Caldwell & Campbell, 3601 Fifth Ave., Altoona, archts. CD 9/9/54.

▲ **N. Y., Great Neck**—SCHOOL—BA 11/11—Bd. Educ., 345 Lakeville Rd., junior and senior high school with swimming pool, $7,900,000. LaPierre, Litchfield & Partners, 292 Madison Ave., New York, Zone 17, archts. CD 6/10.

BUILDINGS—SLC

▲ **Pa., Phila.**—SHOP and OFFICE—Office of Thalheimer & Weitz, archts., 1325 Walnut St., soon lets contract, substructure for maintenance shop and PTC office, $4,500,000, Stewart C. Barnett, 1325 Walnut St., engr. for Phila. Transportation Co., 820 W. Dauphin St., Phila., Pa. CD 6/9.

HEAVY CONSTRUCTION—LB & CA

C. W. Lauman & Co., Inc., 50 Church St., New York, N. Y. LB **$86,344.** Contr. 9, general constr., water supply imprvs., Clinton Rd. WW., GARDEN CITY, N. Y. Village of Garden City, Village Hall, 31 Stewart Ave., Garden City, N. Y. Havens & Emerson, 233 Broadway, New York, N. Y., consult. engrs. Bids Sept. 26. CD 7/12.

Preload Concrete Structure, 93 N. Grand Ave., Baldwin, N. Y. LB **$86,965.** Contr. 10, concrete storage tank. (Garden City, N. Y.)

† **Arundel Corp.**, Pier 2 Pratt St., Baltimore, Md., LB $74,480, Schedule C, mooring dolphin, Pigeon Point and Kilicohook, Salem Co., Eng 36-109-56-7. NEW JERSEY. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Bids Sept. 29;

McLean Contrg. Co., Fidelity Bldg., Baltimore, Md., LB $65,000, Schedule B, of mooring dolphin, Pigeon Point and Kilicohook. (New Jersey).

NEW JERSEY—PENNSYLVANIA—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.
F. A. Canuso & Sons, 173 W. Roosevelt Blvd., Phila., Pa. CA **$525,184,** Contr. G-5, approach bridge over Crescent Blvd. and Black Horse Pike, Walt Whitman Bridge-Gloucester, N. J. approaches for new bridge between Packer Ave. Phila., Pa. and Gloucester, N. J. Ammann & Whitney, 76 9th Ave., New York, N. Y., structural engrs. Modjeski & Masters, State St. Bldg., Harrisburg, Pa. engrs. on approaches. Bids Sept. 16. CD 9/29 under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Pa.—F. D. Kessler, Inc., Northumberland, Pa. LB **$3,067,961.** 5,709 ft. divided road of rein.-con. 24 ft. wide each side of 4 ft. divisor, three I-beam bridges, 1 arch bridge Hamburg Boro, Tilden Twp., T.R.U.S. 22, Berks Co.;
Pa.—John E. Maitland, t/a Maitland Brothers, 81 N. Queen St., Littletown, Pa. LB **$91,540.** 3,661 ft. crushed aggregate base with bit. surf. variable width, Shiremanstown Boro, Lower Allen and Hampden Twps., L.R. 21079 (1), Cumberland Co.;
Pa.—Stabler Constr. Co., 635 Lucknow Lane, Harrisburg, Pa. LB **$285,159.** wid'n. 37,249 ft. existing road with crushed aggregate base, surf. new and old bit. various in width, Jackson and Union, T.R. 305, Huntingdon and Mifflin Counties;
Pa.—Armour Excavation, Inc., 7921 Oxford Ave., Phila. 11, Pa. LB **$359,751.** surf. 25,978 ft. existing road with bit. surf. variable width, city of Philadelphia, Bensalem Twp., T.R. U.S. 13, Philadelphia and Bucks Counties. Bids Sept. 30. CD 9/9.
C. B. Constr. Corp., 1121 Frankford Ave., Phila., Pa., LB **$378,708.** Bid 2466, sewers, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids Sept. 27. CD 9/15;
Frank Reale, 1331 Porter St., Phila., Pa. LB **$75,590.** Bid 2467, sewers (Phila., Pa.).
Blumenthal-Kahn Electric Co., 43 S. Liberty St., Baltimore 1, Md.- LB **$454,000.** Ashburton Pumping Station imprvs., installation of two 1,500 h.p. 28 M.G.D. pumping units, transformers, high and low voltage switchgear, misc. auxiliary equip., BALTIMORE, MD. City, Bureau Water Supply, 503 Municipal Bldg., Baltimore 2, Md. Bids Sept. 28. CD 9/14.
Baltimore Asphalt Block & Tile Co., 1320 N. Monroe St., Baltimore, Md. LB **$125,000.** Hy. Contr. 1380, sheet asph. paving, BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Sept. 28. CD 9/20.

BUILDINGS—LB & CA

▲ **Morgan Park Estates**, c/o Long Island Homes, 168-12 Hillside Ave., Jamaica 32, N. Y., Owner Builds, **$3,700,000.** 150 HOUSES on 37 acre tract on McLaughlin St. near Elwood St., GLEN COVE, N. Y.

▲ **Lakewood Homes**, c/o Par-Sen Realty Corp., 70 W. Montauk Hy., Lindenhurst, N. Y., Owner Builds, **$2,000,000.** 200 HOUSES on tract on St. Joseph's Ave. near Church St., LAKE RONKONKOMA, N. Y.

▲ **Walsh Constr. Co.**, 122 E. 42 St., New York, N. Y. CA Est. **$6,000,000.** 27 story OFFICE, 680-684 Fifth Ave., NEW YORK, N. Y. Canada House New York Ltd., 1290 Broadway St., Toronto, Ont., Canada. CD 9/1.

▲ **Weather Vane Farms**, c/o Robert Nelson, archt., 3683 Hempstead Turnpike, Levittown, N. Y., Owner Builds, **$1,360,000.** 68 HOUSES on tract at Mt. Pleasant Rd., Smithtown Branch, N. Y.

▲ **Beech Hill Terrace**, c/o Sullivan Organization, 2455 Central Park Ave., Yonkers, N. Y., Owner Builds, **$1,250,000.** 47 HOUSES at Crisfield St. and Patton Drive, YONKERS, N. Y.

▲ **Picturesque Manor Homes**, c/o Fochi Bros., 299 Main St., Lodi, N. J., Owner Builds. **$1,400,000.** 70 HOUSES, 25-acre tract, Ruckman Rd. near Piermont Rd., CLOSTER, N. J.

▲ **Walter Kidde Constructors, Inc.**, 140 Cedar St., New York, N. Y., CA, Total Est. **$5,000,000.** biscuit and cracker PLANT, Hy. 208, FAIR LAWN, N. J. National Biscuit Co., 499 W. 14 St., New York, N. Y. CD 8/26.

▲ **Westbury Homes**, c/o Van's Agency, Main St., Mattawan, N. J. Owner Builds. **$1,500,000.** 100 HOUSES, tract near Rte. 34 and Rte. 9, MADISON, N. J.

▲ **J. & H. Cosden Constr. Co., Inc.**, 1348 Teaneck Rd., Teaneck, N. J., CA **$2,500,000.** 104 HOUSES, on Prospect Ave., near Ridgewood Rd., ORADELL, N. J. Oradell Village Homes, c/o contractor.

▲ **Indian Hill Estates, Inc.**, 145 Bellevue St., Elizabeth, N. J., Separate Contracts. **$1,210,000.** RESIDENTIAL development, Hooper Ave. TOMS RIVER, N. J.

▲ **Barnes & Gallagher Constr. Co.**, 400 Shadeland Ave., Drexel Hill, Pa., Separate Contracts, **$1,376,000.** RESIDENTIAL DEVELOPMENT 68 units, Crozer Park, CHESTER, PA.

▲ **Leonard Shaffer Co.**, 207 S. 24 St., Phila., Pa. CA **$1,500,000.** SYNAGOGUE, religious school, community center and parking lot, ELKINS PARK, PA. Reform Congregation, Keneseth Israel, 1723 N. Broad St., Phila., Pa. Bids Sept. 20. CD 9/15.

▲ **C. Robert Fallon**, 159 Glentay Rd., Lansdowne, Pa., Separate Contracts, **$1,680,000.** RESIDENTIAL DEVELOPMENT Leopard Rd., NEWTOWN SQUARE, PA. George Hay, Lima, archt.

United Building Constr. Co., 845 N. 19 St., Phila., Pa. CA **$850,000.** MEDICAL CENTER, Vine near Juniper St., PHILA., PA. A. F. L. Medical Center, Franklin and Thompson Sts. Bids Aug. 8. CD 8/4.

▲ **J. D. Hadin Constr. Co.**, 2900 Newton St., N. E., Wash., D. C., LB **$1,959,900** (9 bidders) HOSPITAL addns, alterations, WASH., D. C. Casualty Hospital, 708 Massachusetts Ave., N. E., Wash., D. C. Bids Oct. 4. CD 8/24.

▲ **Northern Builders Inc.**, 110 S. Union St., Wilmington, Del., Separate Contracts, **$3,000,000.** RESIDENTIAL development, Mill Creek, Hundsed St., WILMINGTON, DEL.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲† **Ala., Selma**—RUNWAY—BA On Or About 11/10—U. S. Eng., P.O. Box 1169, Mobile, Zone 7, new northwest-southeast runway and taxiway incl. 21 acres clearing and topping; 260,000 cu. yds. unclassified excavation; 150,000 sq. yd. bit. surf.; 33,000 sq. yd. conc. paving; 2,700 lin. ft. culvert and storm drain pipe; 1,200 lin. ft. relaying removal pipe; 4,000 lin. ft. removing existing pipe; 50,000 sq. yd. removing existing pavement; 1,600 squares painting runway parkings; 2,400 lin. ft. underground electrical ducts; relocating five bldgs., Craig Air Force Base, ENG-01-076-56-28. CD 9/16.

BUILDINGS—BA

▲ **Va., Richmond**—PLANT—BA 10/18—Reynolds Metals Co., 3rd and Grace Sts., aluminum extrusion plant. $3,000,000. CD 4/28.

▲ **Ga., Dawson**—SCHOOLS—BA 11/1—State School Bldg. Auth., Kemper Bldg., 41 Exchange Pl. S.E., Atlanta, Dawson elementary and Terrell high school addn.; Bronwood Elementary School (mech. remodeling); Graves elementary school (mech. remodeling); Parrott elementary school (mech. remodeling); Sasser elementary school (mech. remodeling); County Colored high school; Northside elementary school; Dunbar elementary school; Helen Gurr elementary school; Martin elementary school, in Terrell Co. Plans deposit $50. Edward V. Jones & Assocs., 405 N. Monroe St., Albany, archts. CD 9/28, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **John J. Pettyjohn**, 212 8th St., Lynchburg, Va., and **Roberts Filter Mfg. Co.**, 6th and Columbia Ave., Darby, Pa., CA **$1,089,520,** water filtration plant, LYNCHBURG, VA. City, R. D. Morrison, city mgr., Municipal Bldg., Lynchburg, Va. Bids Sept. 20, awarded Sept. 27. CD 9/26 under LB.

▲ **FLORIDA**—State Road Dpt., Tallahassee
Fla.—**Cone Bros. Contrg. Co.**, Box 1301, Tampa, Fla., LB **$1,248,824** (10 bidders) heavy excav., stab. roadbed, rock base with bit., b. conc. surf. course, 156 ft., concrete, steel overpass bridge at Seaboard Air Line R.R. west of Lake Wales, 3 concrete culverts of bridge length, other drainage structures 15.02 mi. State Road 25, F-019-3 (10) and FG-019-3 (4), Jobs 1618-202 and 1618-304, Polk Co.;
Fla.—**Dunn Constr. Co.**, 2508 3 Ave., North, Birmingham, Ala., LB **$969,473** (5 bidders) heavy excav., rock base with b. conc. storm sewers roadway lighting 1.665 mi. State Road 527, US-431 (1), Job 7504-275, Orange Co. Bids Sept. 30. CD 9/19.

† **Great Lakes Dredge & Dock Co.**, International Trade Mart, New Orleans, La., LB **$998,888.** fill for runway extension, MacDill Air Force Base, ENG-08-123-56-17. TAMPA, FLA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids Sept. 27. CD 8/29, under LB.

BUILDINGS—LB & CA

Thorington Constr. Co., Inc., 2106 N. Hamilton Ave., Richmond, Va., CA **$630,000.** bus TERMINAL and service bldg., RICHMOND, VA. Atlantic & Richmond Greyhound Lines, Broad and Jefferson Sts., Richmond, Va. Bids Sept. 21. CD 9/27 under LB.

▲ **E. A. Scott & Sons**, Box 946, Americus, Ga., LB **$1,030,631,** Greene County HIGH SCHOOL, Greene County training school; Union Point Elementary school; Siloam Elementary School, GREENSBORO, GA. State School Bldg. Auth., 41 Exchange Pl., S.E., Atlanta, Ga. Bids Sept. 29. CD 8/12.
A. B. Newton, Vidalia, Ga., LB **$700,881,** Ruth Hill Elementary SCHOOL; North Side elementary school; South Side elementary school, NEWNAN, GA. State School Bldg. Auth., Kemper Bldg., 41 Exchange Pl. S.E., Atlanta, Ga. Bids Oct. 4. CD 9/14.

▲† **Blount Bros. Constr. Co.**, Bell Bldg., Montgomery, Ala. LB $1,530,000. feed PLANT constr. in bldgs. C-340, PADUCAH, KY. Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash., D. C. Bids Sept. 30. CD 8/1.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Mich., Oscoda**—APPROACH LIGHTING—BA 10/19—U. S. Eng., Cadillac Tower, Detroit, approach lighting modification, Wurtsmith Air Force Base.

† **Mich., Oscoda**—HOUSING—BA 10/20—U. S. Eng., Cadillac Tower, Detroit, family housing, Wurtsmith Air Force Base.

† **Mich., Oscoda** — INCINERATOR — BA 10/20 — U. S. Eng., Cadillac Tower, Detroit, garbage incinerator, Wurtsmith Air Force Base, Eng. 20-064-56-22.

▲† **Ohio and West Virginia**—BA 10/20—U. S. Eng., 925 Federal Bldg., Pittsburgh 19, Pa., 110x1,200 ft. main lock and 110x600 ft. auxiliary lock with 2 parallel lock chambers on Ohio side, New Cumberland Locks and Dam, Ohio River, $7,000,000. (Correction—bid date). CD 9/30.

(Continued on page 74)

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(Continued from page 72)

▲† Illinois—BUILDINGS, etc.—BA On Or About 11/3—U. S. Eng., 475 Merchandise Mart, Chicago Zone 54, (a) operational (1) three approx. 3,900 sq. ft. addnl. underground storage structures, (2) 1 story 225 sq. ft. generator bldg. addn., (3) 1 story 700 sq. ft. ready bldg., (4) two 1 story approx. 800 sq. ft. interconnecting corridor bldgs., (5) two 1 story approx. 540 sq. ft. generator and frequency changer bldgs., (6) 1 story approx. 2,160 sq. ft. motor repair shop, (7) 1 story approx. 470 sq. ft. storehouse spare parts and battery changer bldg., (8) three, approx. 40 ft. high elevated platforms, (9) misc. structures, incl. pump house and well, sewage pump house, acid pit, wash platform, lube oil shed, grease rack, gasoline storage and dispensing unit, etc.; (b) housing, (1) two 1 story approx. 8,140 sq. ft. and 10,670 sq. ft. E. M. barracks and officers' quarters, (2) 1 story 8,050 sq. ft. administration, recreation and storage bldg., (3) 1 story, 2,550 sq. ft. mess hall, (4) 1 story 880 sq. ft. hobby and PX bldg.; (c) exterior utilities and general site imprvs. in vicinity of Burnham Ave. and 129 St., Cook Co. ENG-11-032-56-16. Plans deposit $100. CD 9/26.

BUILDINGS—BA

▲ Mich., Mount Pleasant — SCHOOL — BA 11/2 — Bd. Educ., Carl Wender, secy., high school, $1,200,000. Louis C. Kingscott & Assoc., Inc., 511 Monroe St., Kalamazoo, archt. CD 11/30/54.

HEAVY CONSTRUCTION—LB & CA

▲ OHIO—State Hy. Dpt., Columbus, Zone 15,

O.—Fischer Constr. Co., 4053 Clifton Ave., Cincinnati, O. LB $2,056,610, est. $2,450,000 (5 bidders) Type T-71 and structures 7.95 mi., SR 4-(8.48-15.02) city of Hamilton, Butler Co.;

O.—The Horvitz Co., 4375 E. 146 St., Cleveland, O. LB $1,487,118, est. $1,620,000 (4 bidders) Type T-35 and structure 6.878 mi., USR 6-(0.00-1.75) Erie-Lorain, village of Vermilion, village of Vermilion-on-the-Lake, Lorain Co.;

O.—H. W. Holt & Son, Inc., 3150 Valleyview Dr., Columbus, O. LB $523,443, est. $761,800 (7 bidders) Type T-35 2.887 mi., S.R. 8-(10.97-13.67) F 595 (3), village of Barnesville, Belmont Co.;

O.—Rhoten Constr. Co., 16 E. Broad St., Columbus, O. LB $826,900, est. $794,200 (4 bidders) Type T-35 on B-119 and structures 6.615 mi., SR 104-(0.00-3.62), S-58 (4), Pike and Scioto Counties;

O.—Frantz Brothers, Inc., 613 Highland Ave., Sidney, O. LB $90,629, est. $104,000 (7 bidders) Type T-35 on B-119 and structure 0.263 mi., SR 725-(9.27-9.31), S-28 (3), village of Camden, Preble Co.;

O.—Soda & Luscher Constr. Co., Inc., Warren Ave. Exten., Niles, O. LB $608,820, est. $638,700 (2 bidders) Type T-35 7.153 mi., SR 7-(20.06-25.19) Ashtabula Co.;

O.—Earl H. Newell & Sons, 116 Woodland Ave., Columbiana, O. LB $260,069, est. $306,500 (6 bidders) Type T-71 and structure 1.053 mi., SR 14A-7.94, Columbiana-Mahoning, village of Columbiana, Columbiana Co. Bids Sept. 27;

received no bids Sept. 27, Type T-35 0.308 mi., USR 35-21.23, SR 7-26.93, Gallia Co.; cancelled bids to have been opened Sept. 27, Type T-35 1.08 mi., USR 25-(7.26-7.93), city of Sidney, Shelby Co. CD 9/1.

▲† United Constr. Co., 1204 Lincoln Ave., Pittsburgh, Pa. LB $1,250,000. Willowick Nike site; LB $1,250,000. Highland Heights Nike site; LB $1,500,000. Warrensville Twp. Nike site; LB $1,150,000. Garfield Heights Independence Nike site; LB $1,180,000. Parma Heights Nike site, OHIO. U. S. Eng., Federal Bldg., Pittsburgh, Pa. CD 8/19.

▲† Algernon Blair Constr. Co., First National Bank Bldg., Montgomery, Ala. CA $1,009,649, est. $1,051,470. airmen's dormitories, Wright Patterson Air Force Base, DAYTON, O. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Sept. 27, awarded Sept. 30. CD 9/14.

▲ H. W. Miller Constr. Co., 1511 Neave St., Covington, Ky. CA $1,193,165. sewage treatment plant, MIDDLETOWN, O. City, Middletown, O. Awarded Sept. 28. CD 6/14/51.

BUILDINGS—LB & CA

▲ Gilmore Olson Co., 1873 E. 55 St., Cleveland 3, O. CA Est. $1,350,000. design and construct 3 story, 56,000 sq. ft. brick, concrete block frozen food processing PLANT 3800 Woodland Ave., CLEVELAND, O. Northern Ohio Terminal, 3800 Orange Ave., Cleveland 15, O. Stouffer Corp., 1375 Euclid Ave., Cleveland 15, O., Lessee. Awarded Sept. 26.

▲ Hallmark Development Co., Robert Ruthenburg, secy., 1098 Case St., Mentor, O., Own Forces, $1,200,000. 70 ranch type HOMES on 2 streets east of S. Center St., MENTOR, O. Awarded Sept. 7.

▲ Ralph M. Parsons Co., 617 S. Olive St., Los Angeles 14, Calif., CA Est. $10,000,000. ULTRAFORMING UNIT, repairing and rebuilding pumphouses and equipment, tanks, etc. WHITING, IND. Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago 80, Ill.

▲ J. L. Simmons Co., Inc., 2146 N. Woodford St., Decatur, Ill., CA $1,000,000. starch drying PLANT, DECATUR, ILL. A. E. Staley Mfg. Co., 2200 E. Eldorado St., Decatur, Ill. Bids Sept. 19, awarded Sept. 27. CD 9/9.

Pithen Constr. Co., 2444 Hariem Ave., Elmwood Park, Ill. Own Forces. $870,000. 40 HOUSES, PALATINE, ILL. Dennis Blair, Prairie View, Ill., archt.

Ockerlund Constr. Co., 4911 Lincoln Ave., Chicago, Ill., CA $356,667. Carpenter SCHOOL addns., new Manor Grade School, PARK RIDGE, ILL. School Dist. 64, 400 S. Western Ave., Park Ridge, Ill. Awarded Sept. 28. CD 9/22, under LB.

Sherman Olson, Inc., 219 N. Kilpatrick St., Chicago, Ill., CA $180,000, 20,000 sq. ft. processing and WAREHOUSE, SKOKIE, ILL. Hoffmann-LaRoche, Inc., 340 Kingsland St., Nutley, N. J., Graham, Anderson, Probst & White, 80 E. Jackson St., Chicago, Ill., archts. Awarded Sept. 27.

Power Service Co., 711 Wesley Temple Bldg., Minneapolis, Minn., CA $357,660, piping in STEAM POWER PLANT addn., ALMA, WIS. Dairyland Power Cooperative, 2615 East Ave., LaCrosse, Wis. V. E. Alden Co., 33 N. LaSalle St., Chicago, Ill., engr. Bids Aug. 19. CD 8/10/54.

▲ F. J. Robers Constr. Co., 690½ Pine St., Burlington, Wis., CA Total Est. $20,000,000. foundation work and dredging of dock and harbor site for GENERATING PLANT, near CASSVILLE, WIS. Wisconsin Power & Light Co., 122 W. Washington St. Madison, Wis. CD 8/3.

▲ Earle McIntosh & Co., 12650 Monte Vista, Detroit, Mich., Owner Builds. $2,500,000. 100 brick ranch HOUSES, Gueley Rd. and Avondale Rd., DEARBORN, MICH.

Elzinger & Volkers, Inc., Holland, Mich. LB $916,790, est. $1,000,000. 4 story men's DORMITORY, HOLLAND, MICH. Hope College, Dr. Irwin J. Lubbers, pres., Holland, Mich. Bids Sept. 22. CD 9/2.

A. W. Kutsche & Co., 6275 Schaefer St., Dearborn, Mich. LB $705,900. general contract, elementary SCHOOL, Harrison St., TRENTON, MICH. P. Schools, Herschell H. Banks, secy., 2340 Third St., Trenton, Mich. Bids Sept. 26. CD 9/9.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ Kan., Manhattan—BA 11/1—City, Orpha Stewart, city clk., WW imprvs., extens., addns., incl. well, well house, and discharge piping, 18-in. supply line from well field to treatment plant; treatment plant addn. 1 m.g filtered waterstorage reservoir and high pressure pumping station; electrical switchgear, power wiring and booster stations, 50,000 gal. tank, $1,300,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. CD 1/26/55.

BUILDINGS—BA

▲ Minn., Aurora—SCHOOL—BA 10/19—Bd. Educ., D. Cuzzo, clk., high school addn., $1,125,000. Plans deposit $25. Jyring & Whiteman, Hibbing, archts. CD 8/17/55.

Tex., Wichita Falls — HIGH SCHOOL — BA 10/27 — Wichita Falls Independent School Dist., Wichita Falls, Junior High School. $750,000. Dixon & Pardue, Box 1799, Radio Bldg., archts., W. B. Ittner, Inc., 911 Locust St., St. Louis, Mo., consult. archt. CD 10/20/54.

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HEAVY CONSTRUCTION—LB & CA

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul,
L. G. Arnold, Inc., Box 228, Eau Claire, Wis. CA **$1,298,123.** Bridge No. 6746 over Mississippi River at St. Cloud, Stearns Co. CD 9/27, under LB.

Hennessey Bros., 4001 First Ave. S.E., Cedar Rapids, Iowa. CA **$537,760.** north side interceptor sewer, OTTUMWA, IOWA. City, City Hall, Ottumwa, Iowa. Bids Sept. 20. CD 5/15/53.

† **Farnsworth & Chambers Co. Inc.**, Box 74, Houston, Tex., CA **$737,408**, storage facilities for Ordnance area, Little Rock Air Force Base, ENG-03-050-56-4. JACKSONVILLE, ARK. U. S. Eng., P.O. Box 867, Little Rock, Ark. Bids Sept. 14. CD 9/23, under LB.

† **American Elin Corp.**, 1 Wall St., New York, N. Y., LB **$277,368**, Schedule 1, three 20,000/26,667/33,-333-kva autotransformers; LB **$91,390**, Schedule 2, one spare 20,000/26,667/33,333-kva autotransformer for Granite Falls substation, Missouri River Basin Proj., Spec. DS 4430. SOUTH DAKOTA. Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. Bids Sept. 27. CD 9/20.

† **Rentlor Constr. Co. Inc.**, Grand Island, Neb., LB **$203,564**, est. $167,881, earthwork, and structures for Sargent Canal, laterals 6.0 through 20.0-0.9, Missouri River Basin Proj., Middle Loup Div., Spec. DC 4453, Custer Co., NEBRASKA. Bureau Reclamation, Dpt. Interior, Sargent, Neb. Bids Sept. 22.

▲† **Nolan Brothers, Inc.**, Box 9157, Fort Worth, Tex., LB **$1,495,140**, est. over $200,000, apron, parking operational pad, heavy test stand, jet engine, Clinton-Sherman Air Force Base, NOY 88922, CLINTON, OKLA. Dept. Navy, Bureau Yards & Docks, Bldg 16, Naval Station, New Orleans, La. Bids Sept. 27. CD 9/8.

▲ **MONTANA**—State Hy. Comn., Helena,
Mont.—**Union Constr. Co.**, Missoula, Mont. CA **$624,-220.** grade, grav. bit. surf. drain 14.495 mi. Hamilton-Florence Rd., Ravalli Co.;
Mont.—**Gilbert Marshall**, Roundup, Mont. CA **$180,166.** grade, drain 8.288 mi. of Van Norman-Glasgow Rd., McCone Co.;
Mont.—**James Crick & Sons**, W. 1220 Ide St., Spokane, Wash. CA **$164,891.** grade, drain 2.029 mi. Helena-Fisher Pass-Lincoln Rd., Lewis and Clark Co.;
Mont.—**Richardson Constr. Co.**, Miles City, Mont. CA **$256,966**, grade, grav. plant-mix oil drain 11.499 mi. Reserve-North Dakota Line Rd., Sheridan Co.;
Mont.—**Earl L. McNutt**, Eugene, Ore. CA **$270,016.** grade, grav. plant-mix oil drain 6.004 mi. Fairfield-west road, Teton Co.;
Mont.—**Stanley H. Arkwright, Inc.**, 1200 Sixth Ave. N., Billings, Mont. CA **$223,963.** grav. bit. surf. revise 100 ft. pile bridge and drain 6.132 mi. Broadview-Lavina Rd., Golden Valley Co.;
Mont.—**Naranche & Konda**, 2801 S. Montana St., Butte, Mont. CA **$74,779.** crush, stockpile 71,250 tons ¾ in. crushed grav. from five crusher setups, Park and Gallatin Counties;
Mont.—**O'Neil Constr. Co.**, Havre, Mont. CA **$367,388.** grav. bit. surf. drain 8.023 mi. Devon section of Shelby-Chester Rd., Toole Co.;
Mont.—**Max J. Kuney Co., Inc.**, N. 120 Ralph St., Spokane, Wash. CA **$231,067.** grav. surf. bit. surf. 9.798 mi. White Sulphur Springs-Kings Hill Rd., Meagher Co.;
Mont.—**O'Brien Constr. Co.**, 1127 Smelter Ave., Black Eagle, Mont. CA **$110,353.** grav. bit. surf. drain 4.601 mi. Ovando-Rogers Pass Rd., Lewis and Clark Co. Grand total $2,503,809. Bids Sept. 29. CD 9/21.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver.
Gardner Constr. Co., Glenwood Springs, Colo., CA **$807,656**, est. $841,394, bridges, approaches at the Speer interchange of the Valley Hy. Proj. No. UI 002-2 (23) Unit 3 and CC 01-9001-09, Denver Co. Bids Sept. 30, awarded Sept. 30. CD 9/23.

BUILDINGS—LB & CA

▲ **Caroll Constr. Co.**, 1330 E. 10 St., Kansas City, Mo. CA **$1,000,000.** Farmers Market SHOPPING CENTER, 72,000 sq. ft. parking, separately leased units for retail and office space, KANSAS CITY, MO. Caroll Investment Co., Frank Caroll, c/o contractor. Wilson & Earnheart, Terrace Bldg., Kansas City, Kan., archts.

▲ **Hutter Constr. Co.**, 134 Western Ave., Fond du Lac, Wis. CA Est. **$4,000,000.** 8 story, 44x372 ft. HOSPITAL addn., 2 floors on convent bldg. "H" St. Francis St. wing, 3 elevators, WICHITA, KAN. St. Francis Hospital, 928 N. Emporia St., Wichita, Kan. CD 9/21.

Estrin Constr. Co., 828 E. 9 St., Kansas City, Mo. CA Est. **$850,000.** 179,000 sq. ft. concrete block WAREHOUSE, KANSAS CITY, KAN. B. F. Goodrich Co., 621 E. 14 Ave., North Kansas City, Mo. W. B. Fullerton Jr., 15 W. 10 St., Kansas City, Mo. and E. C. McCamis, 1804 Swift St., Kansas City, Mo., archts.

▲ **Brown & Root, Inc.**, Box 3, Houston, Tex. CA Approx. **$1,500,000.** COMPRESSOR STATION with auxiliary bldgs., 5 mi. south of Vidor, TEXAS. Texas Eastern Transmission Corp., Texas Eastern Bldg., Shreveport, La. CD 9/22.

▲ **Hal C. Dyer**, Lone Star Gas Co. Bldg., Dallas, Tex., CA **$1,849,580.** est. $1,475,000. Senior HIGH SCHOOL, Prairie Creek Rd. in Pleasant Grove area, DALLAS, TEX. Dallas Independent School Dist., 3700 Ross St., Dallas, Tex. Bids Sept. 27. CD 10/4, under LB.

▲ **Stone & Webster Engineering Corp.**, 90 Broad St., New York, N.Y. CA **$6,400,000.** Design and Construct, steam electric GENERATING PLANT, EL PASO, TEX. El Paso Electric Co., Electric Bldg., El Paso, Tex. CD 10/5.

▲ **C. Grady Cates, Builder**, 9747 Harry Hines Blvd., Dallas, Tex., CA **$410,000.** 41 DWELLINGS; CA **$347,500**, 28 dwellings; CA **$377,400**, 38 dwellings. Grand total $1,134,900, FARMERS BRANCH, TEX. C. Grady Cates, Jr., 9747 Harry Hines Blvd., Dallas, Tex. CD 4/19.

▲ **John B. Brown**, 7026 Lawndale St., Houston, Tex., CA **$359,875**, 28 DWELLINGS; CA **$365,000**, 32 dwellings; CA **$369,180**, 36 dwellings, Grand total $1,094,055. HOUSTON, TEX. Canterbury Village, Valentine Land Co., c/o John Wheat, Bank of Commerce Bldg., Houston, Tex. CD 7/27.

▲ **Tellepsen Constr. Co.**, 1710 Telephone Rd., Houston, Tex., CA **$5,000,000.** APARTMENT; CA **$475,000.** 375 auto parking GARAGE, HOUSTON, TEX. Louis Cowan, 5201 Fannin St., Houston, Tex. CD 9/14.

▲ **Arrington-Bradley Building Co.**, 7445 Park Place Blvd., Houston, Tex., CA **$345,500**, 6 masonry DWELLINGS; CA **$349,000**, 8 masonry dwellings; CA **$367,-215**, 11 masonry dwellings. Grand total $1,061,715. HOUSTON, TEX. Glenbrook Oaks Development Co., R. L. Bradley, pres., 7445 Park Place Blvd., Houston, Tex. CD 3/15.

▲ **Arrington-Bradley Building Co.**, 7445 Park Place Blvd., Houston, Tex., CA **$366,125**, (C) 25 DWELLINGS. CA **$378,222**, (D) dwellings; CA **$357,228**, 23 dwellings, Grand total $1,101,575, HOUSTON, TEX. Lakeside Oaks Development Co., R. L. Bradley, pres., 7445 Park Place Blvd., Houston, Tex. CD 3/15.

▲ **Walter M. Mischer & Assocs.**, 6925 Navigation Blvd., Houston, Tex., Owner Builds, **$348,000**, Schedule 10, 30 DWELLINGS; **$376,185**, Schedule 11, 36 dwellings; **$367,500**, Schedule 12, 33 dwellings. Grand total, $1,091,685, HOUSTON, TEX. CD 6/8.

▲ **Brown & Daniels Co.**, 10604 Harry Hines Blvd., Dallas, Tex., CA **$399,750**, 45 DWELLINGS; CA **$347,515**, 30 dwellings; CA **$390,500**, 41 dwellings, Grand total $1,137,765. IRVING, TEX. R. F. Daniels & Assocs., 10604 Harry Hines Blvd., Dallas, Tex. CD 8/3.

▲ **Lloyd A. Denton and Arthur Bird**, Milam Bldg., San Antonio, Tex. Own Forces. **$348,600.** Lot 16, 22 DWELLINGS; **$420,000**, Lot 17, 42 dwellings; **$368,-115**, Lot 18, 26 dwellings. Grand total $1,136,715, SAN ANTONIO, TEX. CD 5/27.

▲ **Freeway Park Development Corp.**, c/o Shirley Briggs, Bd. Member, LaMarque, Tex., Own Forces, **$369,500**, Unit 11, 32 DWELLINGS; **$359,000**, Unit 12, 27 dwellings; **$345,000**, Unit 13, 24 dwellings. Grand total $1,073,500. TEXAS CITY, TEX. CD 2/24.

Stearns-Roger Co., 660 Bannock St., Denver, Colo., CA **$750,000.** PLANT to produce lightweight aggregate. LARAMIE, WYO. Great Western Aggregate, Inc., Denver Natl. Bldg., Denver, Colo.

Mead & Mount Constr. Co., 1560 Denver Club Bldg., Denver, Colo., LB **$440,000.** est. $350,000. new AUDITORIUM and rehabilitation center remodeling, DENVER, COLO. National Jewish Hospital of Denver, E. Colfax Ave. and Colorado Blvd., Denver, Colo. Eugene D. Sternberg, 2364 E. 3rd Ave., Denver, engr.-archt.

▲ **Gamble Building Co.**, 1726 Champa St., Denver, Colo., Owner Builds. Approx. **$2,500,000.** 202 RESIDENCES, STERLING, COLO.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

† **IDAHO**—Bureau P. Rds., Dpt. Commerce, 609½ Bannock St., Boise, Idaho,
Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, LB **$271,146** (8 bidders) 12.7 mi. road with 150 ft. rein.-con. bridge over Warm Springs Creek on South Fork Fayette River east of Lowman, Boise Co. Bids Sept. 28. CD 9/16.

▲† **Sound Constr. & Engrg. Co.**, 1300 Aloha St., Seattle, Wash., LB **$1,457,981** est. $1,229,943 (12 bidders) direction-center station, Inv. 56-38, COTTONWOOD, IDAHO. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Oct. 4.

J. E. Thomas, Moscow, Idaho, LB **$209,600.** ice skating rink and adjacent facilities, MOSCOW, IDAHO. University of Idaho, Moscow, Idaho.

† **Marshall & Haas**, Yuma, Ariz., LB **$371,173**, est. $322,096, earthwork, concrete canal and lateral lining pipe lines and structures for repairs, extens., imprvs. to Yuma Auxiliary Proj. Yuma Auxiliary Proj., Spec. DC 4481. ARIZONA. Bureau Reclamation, Dpt. Interior, Yuma, Ariz. Bids Sept. 29. CD 9/12.

† **WASHINGTON**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland, Ore.
J. D. Shotwell, 3113 S. Pine St., Tacoma, Wash., CA **$439,268** (5 bidders) grading, surf. 5.554 mi. Olympic Hy. Proj. 2-I, Clallam Co. Bids Sept. 29. CD 9/22.

† **G. Chicha Co.**, E2917 Sharp St., Spokane, Wash., LB **$644,575**, est. $459,795 (5 bidders) radar installation on Mica Peak for Geiger Air Force Base, Inv. 56-36, Spokane, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Sept. 30.

Shaffer Constr. Co., Everett, Wash., CA **$186,963** (14 bidders) 200x210 ft. aircraft maint. and overhaul hangar, Paine Field. EVERETT, WASH. Snohomish Co., Court House, Everett, Wash. Bids Sept. 28. CD 9/15.

C. T. Madsen, 808 N. 12 St., Tacoma, Wash., LB **$89,647** (3 bidders) multiple and series street lighting sys., using mercury vapor units, OLYMPIA, WASH. City, City Hall, Olympia, Wash. Bids Sept. 27. CD 9/16;
Line Material Co., 1220 W. Nickerson St., Seattle, Wash., LB **$85,874** (10 bidders) materials for street lighting sys. (Olympia, Wash.).

F. Coluccio, 7743 Seward Park Ave., Seattle, Wash. CA **$88,719**, Contr. No. 3, 3,400 g.p.m. underground pump station, SEATTLE, WASH. Southwest Suburban Sewer Dist., 10023 16th Ave. S. W., Seattle, Wash. Bids June 27, awarded Sept. 27. CD 7/5 under LB.

N. W. White, Pier 65, Seattle, Wash., CA **$532,632**, primary-type sewage treatment plant, SEATTLE, WASH. Southwest Suburban Sewer Dist., 10023 16 Ave. S. W., Seattle, Wash. Bids July 11, awarded Sept. 27. CD 7/18 under LB.

Ostruske-Murphy, Inc., 1515 Center St., Tacoma, Wash. CA **$638,955**, 50 m.g. concrete lined reservoir, TACOMA, WASH. City, City Hall, Tacoma, Wash. Bids Sept. 26. CD 9/30 under LB.

BUILDINGS—LB & CA

Anderson Constr. Co., 115 S. 9 St., Tacoma, Wash., CA **$585,000.** BUILDINGS alterations at Salishan Housing Proj. TACOMA, WASH. Tacoma Housing Auth., 132 Longview St., Tacoma, Wash. Bids July 7. CD 7/15 under LB.

▲ **P. McInnis & H. George & Sons**, Hutton Bldg., Spokane, Wash., CA Est. **$1,600,000** (with equip.) 2 story 63x81 ft. and 35x42 ft. rein.-con. TELEPHONE BLDG. addn. WALLA WALLA, WASH. Pacific Telephone & Telegraph Co., Telephone Bldg., Seattle 1, Wash.

Crown Constr. Co., 1231 S. LaBrea St., Los Angeles, Calif., CA **$737,500**, 67 frame, stucco HOMES Porter, Orchard, Hill and Orangethorpe Sts. in Tract 2280. FULLERTON, CALIF. Fullerton Plaza Co., 1231 S. LaBrea St., Los Angeles, Calif.

B. B. Karger & Assoc., 11867 E. Firestone Blvd., Norwalk, Calif., Owner Builds. **$609,000** 58 frame stucco DWELLINGS, Woodcrest, Baker, Cedar Sts. FULLERTON, CALIF.

▲ **F. E. Young Constr. Co.**, 2141 Main St., San Diego, Calif., LB **$2,749,000.** HIGH SCHOOL No. 2. RIVERSIDE, CALIF. Riverside City High School Dist., 3954 12th St., Riverside, Calif. CD 4/26.

Marine Development Co., Box 1122, LaJolla, Calif. CA **$891,187**, 74 frame, stucco, DWELLINGS, Northhaven and Southcrest Aves., SAN DIEGO, CALIF. Western Hills, Inc., Box 1122, LaJolla, Calif.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **ONTARIO**—Dpt. Highways, Parliament Bldgs., Toronto, Ont.—**Monarch Engineering Ltd.**, Midland St., Agincourt, Ont., CA **$517,913** (7 bidders) hot mix paving, granular base 2.68 mi. Hy. 401, east of Don Mills Rd. to east of Kennedy Rd. in Toronto area. Contr. 55-195;

Ont.—**Wollatt Constr. Ltd.**, 2171 Ottawa St., Windsor, Ont., CA **$613,227** (4 bidders) grading, culverts, granular base, hot mix paving 13.3 mi. Hy. 18 from Amherstburg to Harrow, Contr. 55-180. Awarded Sept. 30. CD 10/5, under LB.

Dravo of Canada Ltd., 159 Bay St., Toronto, Ont., CA Est. **$750,000-$1,000,000.** liquid cargo dock on Lake Ontario, MILLHAVEN, ONT. Liquifuels, Ltd., 347 Bay St., Toronto, Ont. CD 7/15 under Industrial Buildings.

Montreal Dual Mixed Concrete, Ltd., 3701 Cote St. Michel Rd., Montreal, Que., CA Est. **$700,000.** pavements and sidewalks on Blvd. St. Michel from north limits to south limits in Montreal suburb of St. Michel. MONTREAL, QUE. City of St. Michel, City Hall, St. Michel, Que. Awarded Sept. 30. C. Poirier, c/o owner, engr.

BUILDINGS—LB & CA

Frid Constr. Co. Ltd., New Harbor Administration Bldg., Hamilton, Ont., CA Est. **$190,000.** 1 story, 26,000 sq. ft. brick, steel frame PLANT exten., OAKVILLE, ONT. Canadian General Electric Co. Ltd., 212 King St. W., Toronto, Ont. Wilson & Newton, 1104 Bay St., Toronto, archts. Awarded Sept. 28.

▲ **Hill-Clark-Francis, Ltd.**, Lorne St. S., Sudbury, Ont., LB **$1,331,008** (6 bidders) HIGH SCHOOL, SUDBURY, ONT. Nickel District Collegiate Institute Bd., 12 Stewart Dr., Sudbury, Ont. Bids Aug. 24. CD 8/9.

▲ **Aylmer Homes, Ltd.**, Koronet Inn, Fraser Rd., Aylmer, Que. Owner Builds. **$12,000,000.** 1,000 HOMES, AYLMER, QUE. M. H. Dineen & Assocs., 168 Charlotte St., Aylmer, Que., engrs.

Byers Constr. Co. Ltd., 5675 Western Ave., Montreal, Que., CA Est. **$800,000** (2 bidders) 1 story 160x800 ft. steel, brick TUBE MILL, MONTREAL, QUE. Noranda Copper & Brass, Ltd., Durocher and Sherbrooke Sts., Montreal, Que. Noranda Mines, Ltd., Noranda, Que., engr. Awarded Sept. 30.

Richard & B. A. Ryan Ltd., 1705 William St., Montreal, Que., CA, **$125,000** (6 bidders) 1 story 60x462 ft., WAREHOUSE, DELSON, QUE. Siporex Ltd., 640 Cathcart St., Montreal, Que. Meadowcroft & Mackay, 4115 Sherbrooke St. W., Montreal, archts. Stadler, Hurter & Co., 1117 St. Catherine St. W., Montreal, engrs.

IF IT'S A
WET JOB
PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY
GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

SAVE TIME AND FLOOR SPACE

KINNEAR Rolling Doors

Kinnear Rolling Doors open upward. They coil *compactly* above the opening. Surrounding floor, wall and ceiling space is *always fully usable.* The interlocking-slat curtain (originated by Kinnear and famous for over 50 years) give *all-steel protection* against fire, storms, rioters. Manual or motor operation. Built to fit any opening. Write for new catalog.

The KINNEAR Manufacturing Co.
1820-40 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.

KINNEAR ROLLING DOORS
Saving Ways in Doorways

UNIT PRICES

Bridges and Road, Mo.

Four bids on road construction and two bridges in St. Genevieve County, Mo. resulted in a $125,934 contract awarded by Missouri State Highway Department, Jefferson City, to M. J. Davidson, St. Louis, Mo. Rex M. Whitten is chief engineer.

The larger bridge accounts for $68,185 of the contract price. It is 213.8 ft long, with 67'-80'-67' continuous I-beam spans. The roadway is 20 ft wide and 22 ft above the stream bed. The smaller bridge, $26,247, has three 43-ft I-beam spans. Both are designed for H 10 loading.

Concrete must test at 3,000#. All piling is 10-in. bearing piles at 42 lb in these approximate lengths: 16 at 40 ft, 16 at 45 ft. Each pile must sustain a load of 37 tons.

Bidders include:

1C	M. J. Davidson, St. Louis, Mo.	$220,366
2	Orco Contracting Co., Kirkwood, Mo.	$241,774
4	Samuel Kraus Co., St. Louis, Mo.	$269,293

Road Work

Bids: 7-26-55 Items	Unit	Quantity	Unit Prices 1C	2
Clearing	ac	17.1	$250.00	$250.00
Grubbing	ac	15.2	150.00	250.00
Excavation, Cl A	cy	57,019	0.48	0.60
Cl C	cy	8,774	2.10	2.40
Stock pile borrow*	cy	750	0.288	0.36
Machine grading, Cl 1	stay	284.0	45.00	50.00
Cl 2	stay	125.5	50.00	60.00
Subgrade scarifying	stay	37.0	20.00	20.00
Removing 8 misc items	ls	1	700.00	500.00
Placing rock fill	cy	74	5.00	4.00
rock blanket	cy	55	5.00	4.00
Gravel B or cr stone surf	cy	8,655	2.00	2.30
in stock piles	cy	900	2.00	2.30
Conc, Cl B, box culv	cy	76.4	80.00	80.00
other than box culv	cy	3.0	125.00	120.00
Culvert pipe, 12"	lf	2,668	3.00	3.20
18"	lf	974	4.00	4.00
18"	lf	626	4.30	4.50
24"	lf	204	6.00	6.50
30"	lf	246	7.00	7.25
CM, 72"	lf	66	32.00	30.00
78"	lf	58	42.00	40.00
metal arch, type B 4	lf	78	7.00	8.00
Steel, reinforced	lb	7,590	0.16	0.16
Guard rail	lf	25	5.00	5.00
Remov 37 exist struct culv	ls	1	1,500	1,700
bridge	ls	1	500.00	700.00

* at 60% of unit price for Cl A excavation

Bridge, I-beam, three 43-ft spans

Excav, Cl 1 for struct	cy	20	$20.00	$18.00
Conc, Cl B, superstruct	cy	62.6	80.00	80.00
substruct	cy	38.8	80.00	80.00
Fab struct steel, substr	lb	1,890	0.20	0.18
I-beam spans	lb	51,590	0.165	0.18
Gray iron alloy castings	lb	1,280	1.00	1.00
Reinforcing steel	lb	15,380	0.16	0.18
steel piles, 10" in pl	lf	516	8.00	10.00
cut-offs*	lf	54	4.00	5.00

Bridge, 67'-80'-67' continuous I-beam

Excav, Cl 1 for struct	cy	170	22.00	20.00
Cl 2 for struct	cy	170	22.00	20.00
Conc, Cl B, superstruct	cy	102.8	80.00	80.00
substruct	cy	137.4	80.00	80.00
Fab struct steel	lb	117,620	0.165	0.17
Steel casting	lb	5,210	1.00	1.00
Steel piles, 10" in pl	lf	1,264	8.00	10.00
cut-offs*	lf	96	4.00	5.00
Remov exist struct	ls	1	2,000	1,000

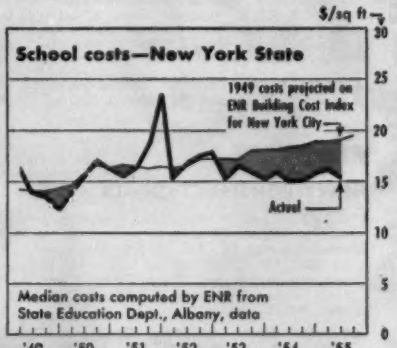
* at 50% of price bid for 10" steel piles in place

Time allowed: 110 working days
Liquidated damages: $25.00 per day

School Contract Prices Stay Down As Costs Rise

Through the first quarter of 1955 contract prices per square foot for schools in New York State bump along the $15 line while corresponding 1949 prices, had they climbed with the rise in construction labor and materials costs, would now top $19.

How much credit for holding down prices goes to the designers and how much to the builders cannot be detected from the statistics.



Schools in New York State Cost This Much per Square Foot

State Education Department, Division of School Building and Grounds

	Elementary, K-6 No of Schools K-6 Total	$ per sq ft for schools with ... 1 Large Unit* Min	Med	Max	2 Large Units* Min	Med	Max	3 Large Units* Min	Med	Max	Secondary, 7-12 No of Schools 7-12 Total	$ per sq ft Min	Med	Max
1949	29	$10.40	$14.00	$19.20	$12.00	$14.60	$18.70	.....	.....	.....	4	$13.20	$13.55	$16.20
1950	20	10.85	17.00	20.80	13.75	16.66	17.80	.....	.....	.....	4	13.35	13.70	14.40
1951	59	12.30	16.45	25.40	18.70	20.25	22.60	$13.90	$23.60	$29.20	8	15.40	16.97	19.30
1952	57	11.40	16.30	20.20	13.00	17.60	21.10	14.20	18.20	23.30	7	15.00	17.10	19.90
1953	65	10.20	16.05	23.40	13.60	16.15	19.40	11.30	16.30	18.80	12	14.15	16.00	18.80
1954	70	10.00	14.55	20.80	12.80	16.05	21.80	14.80	15.30	18.40	17	13.70	15.60	18.00
55, Q1	8	13.60	16.75	17.35	12.70	14.00	15.20	.....	14.90	.....	5	12.55	15.00	17.50
Q2	13	11.75	15.45	19.90	11.90	15.70	17.20	.....	.....	.....	2	15.60	16.40	17.20

* Large Unit includes a general purpose room, gymnasium, auditorium, multi-purpose or other group activity room

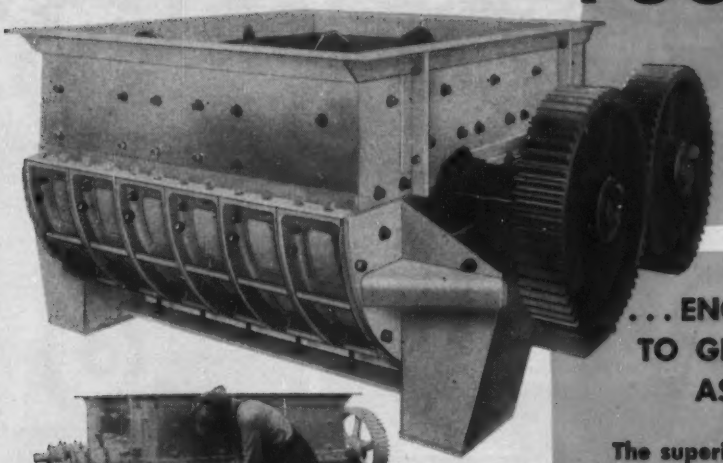
These are costs based on the four contracts—general construction, plumbing, electrical, heating and ventilating. They include built-in features, but no movable furniture or equipment. Some minor site improvement may be included, but no major site work and no land costs.

MADSEN

MADSEN WORKS — MADSEN — LOS ANGELES

Equipment that Serves ®

TWIN-SHAFT PUG MILL MIXERS



MODEL 440
PATENT PENDING

AVAILABLE IN 4000-LB., 5000-LB. AND 6000-LB. CAPACITIES

EXTERNALLY REMOVABLE LINER SEGMENTS

Replacing worn liner segments in the Model 440 Pug Mill Mixer can be accomplished by one man in the field in a matter of 20 minutes . . . just one of the years-ahead MADSEN features.

HELPING TO BUILD THE HIGHWAYS OF THE WORLD — MADSEN — Since 1910

. . . ENGINEERED FOR FASTER MIXING TO GIVE YOU A MORE PROFITABLE ASPHALT PLANT OPERATION

The superior performance of the MADSEN Model 440 Twin-Shaft Pug Mill Mixer is due primarily to four in-built MADSEN features. (1) The general contour of the mixer; (2) the patented shank design; (3) the arrangement of the paddles; and (4) the extra large discharge gate. The foregoing basics, a concept of pressure mixing — insure a fast mix especially when combined with the MADSEN Pressure Injection System. Discharge time — approximately 4 seconds regardless of batch size! The Model 440 is ruggedly built to withstand the day-by-day punishing effects of hard abrasive aggregates. It is oversize throughout to assure dependable, long-lived operation.

Yes, MADSEN gives you money-making advantages in the individual plant units that add up to a more profitable overall asphalt plant operation. So be sure your asphalt plant equipment is MADSEN-BUILT!

SOME OUTSTANDING FEATURES

- **Patented heavy cast steel mixer shanks for faster mixing with less wear and less power required.**
- **Externally removable edge-ground liner segments which eliminates need to remove shanks and tips to replace worn liners.**
- **Heavy-duty, cast steel cut tooth gears, with improved tooth angle for smoother operation.**
- **Heavy-duty interior combination thrust and seal collars, made of white iron and split for easy replacement.**
- **Mixer lower ends, upper ends, upper sides and center bridge forming the gate area are of fabricated steel, heavily welded throughout, built on accurately machined jigs to insure uniform fitting of liners, shafts, bearings and gate rails.**

BALDWIN — BLH — LIMA-HAMILTON

CONSTRUCTION EQUIPMENT DIVISION

MADSEN WORKS

CONSTRUCTION EQUIPMENT DIVISION
Baldwin-Lima-Hamilton Corporation

14120 EAST ROSECRANS AVENUE • P.O. BOX 38 • LA MIRADA, CALIF., U.S.A.

MIANUS RIVER DAM and Reservoir, Greenwich, Fairfield Co., Conn., for Greenwich Water Co. Merritt, Chapman & Scott Corp., *Contractors;* American Water Works Service Co. Inc., Phila., Pa., *Consulting Engineers;* DeLeo Bros., Inc., Stamford, Conn., *Excavation Sub-contractors.*

On Mianus River Dam, Greenwich, Conn.

IT'S MACKS 100%

This project, which is being built to insure an adequate water supply for Greenwich, Conn., Port Chester and Rye, N. Y., involves moving 375,000 cubic yards of earth and rock fill.

The dam itself will be 1,200 ft. long, 77 ft. high, 430 ft. across at the base and 20 ft. across at the top. As Mr. Sam DeLeo of DeLeo Bros., Stamford, Conn. excavation contractors, puts it, "We've got a real earth-moving job here, all right.

"To do the best job, and to be sure we fulfill our contract on schedule, we're relying on Macks.

"Ours is a Mack fleet, exclusively. Moreover, the additional trucks we've hired to increase our hauling capacity on this job are Macks. In fact, with us, it's Macks all the way."

DeLeo Bros., like so many heavy construction contractors, have used Macks for years. They know that Macks keep cycle time down over the toughest terrain. Fast, uninterrupted schedules are assured, thanks to Mack's Balanced Bogie and exclusive Power Divider . . . the combination that provides maximum flexibility, even tire loading, uniform braking and positive traction in soft or slippery going.

In addition, the fact that Mack makes more of its own components than any other manufacturer means that Macks are built better from the axle up. They're stronger, require less maintenance, assure longer service life. As Mr. DeLeo says: "It pays to invest in Macks."

MACK TRUCKS Empire State Building, New York 1, N. Y. 3130

Cement, Steel Shortages Bother Contractors

Key materials now are in short supply in some regions, as construction boom heads toward end of open weather

Local shortages of materials continue to plague contractors, but planning tends to be optimistic.

In Louisville, for instance, the major drawback is the shortage of cement. Contractors in this area are using imported German cement to eke out local supplies. Ready-mix companies are now asking $15.80 per cu yd. A little while back, their price was $12.80. Bagged cement is selling as high as $2 to $2.05 per bag, while prices are reported as high as $8 to $10 on a per barrel basis.

However, big construction projects are being announced around Louisville. Architects report more work on their boards than at any time in several years. General Electric Co. has just announced plans for a $5-million factory at its Appliance Park.

The governors of Indiana and Kentucky have just agreed on construction of a $12-million bridge across the Ohio River between West Louisville and New Albany, Ind. The Indiana Toll Bridge Commission will finance and operate the project. Kentucky will build approaches on its side.

• **Indiana**—In eastern Indiana, there's a similar shortage of cement, with ready-mix prices hopping nervously upward $3 per cu yd. Many homes, business buildings, schools, and churches are being held up as a result of the shortage. One local cement dealer predicts that the shortage will remain acute until November, when homebuilding and road construction slacken.

The Indiana Turnpike doesn't seem to have much to do with this shortage, even though paving is now under way on the eastern half of the 156-mi superhighway. During the past 18 months, about 10,000,000 bbl of cement have been shipped into the Indiana Turnpike area, of which only about 8% has been used on turnpike construction. During the same period, cement mills located close enough to supply the turnpike area produced about 80,000,000 bbl.

Cement executives believe that there is considerable "scare buying" by builders and ready-mix plants. And to make matters worse, rumor has it that some dealers are saving their dwindling supplies for their best customers.

• **Ohio**—Around Columbus Ohio, cement shortages were delaying projects. For instance, a local interchange project has been delayed because the contractor has been getting only about three-quarters of the cement he needs to stay on schedule. The architect of the Columbus Veterans Memorial project appealed to U. S. Senator John Bricker to get some cement diverted from the huge runway project at nearby Lockbourne Air Force Base. But Air Force people say they are taking only 30% of their needs from the central Ohio area.

• **Steel shortage**—Up to five months' delay in steel shipments has been reported in western New York where millions of dollars' worth of construction, especially on schools, hospitals, and public buildings, is being held up.

Some fabricators in the area find it impossible to promise delivery on structurals till spring. On some jobs where steel was promised as long ago as July, orders have not yet been filled and construction has halted.

Sewage Disposal

Unique financing program gets huge project started in Allegheny County, Pa.

The long-delayed sewage disposal project for the Ohio River Basin in Allegheny County, Pa., finally got its financing last week in a unique arrangement.

The $100-million sewerage system, in the planning stage since 1946, will take the sewage from community systems to a central treatment plant. It will serve Pittsburgh and 66 other communities in a 180-sq-mi area. Sixty-four miles of trunk lines will run along the Allegheny, Monongahela, and Ohio Rivers, and Chartiers and Turtle Creeks, to a 50-acre plant in Pittsburgh near McKees Rocks Bridge.

Called an "interceptor system" because it will intercept sewage now being poured into the rivers, the new lines and treatment plant will enable the county to comply with the state Pure Stream Act.

First bids will probably be out late this month, with construction starting about year-end. The system is scheduled to be in operation by 1959.

• **Financing method**—Here's how the financing works: A group of 23 banks headed by Pittsburgh's Mellon National Bank & Trust Co. has loaned the Allegheny County Sanitary Authority $100 million at 2¼% for a maximum of four years. That means the authority will not have to try to borrow money in today's tight bond market, but can pick the most favorable times during the next four years to sell its bonds, in large or small blocks. One estimate is that if the authority tried to sell the whole bond issue right now, the rate would be from 3½% to 3⅝%—much higher than the 2¼% charged for short-term financing by the banks.

• **Low interest cost**—The authority can go ahead and get bids. At the same time, it will invest its borrowed money in short-term government securities. The income it will get from these investments will cut its actual interest cost during construction to a very small amount—saving perhaps $4 million or $5 million.

• **Collateral**—The securities will also provide collateral for the bank loan. As contractors are paid, the authority can sell off government securities to get cash. When it does so, the interest rate on that part of the bank loan no longer protected by collateral will rise to 2¾%.

Of course, the bank loan itself will be paid off as the authority sells its long-term bonds during the four-year loan period. These bonds will be backed by sewerage charges—estimated to run about $15 for individual homes—plus the guarantees of local communities.

A Peak for Copper Prices?

The rise in copper prices seemed to have passed its peak last week. Custom smelters cut the price for refined copper from 50 cents a pound to 47 cents in two separate steps. Meanwhile, major producers are holding the line at 43 cents.

The price cuts in the over-the-counter market followed sharp declines in the price of scrap copper, and a price decline in quotations on the London copper market.

(*B&F continued on page 80*)

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Bridge Headaches

Delaware and New Jersey Dicker Over Use of Tolls

The States of New Jersey and Delaware face the problem of whether to pay off the remaining debt of the Delaware Memorial Bridge and give the public a free bridge, or keep the 75-cent toll and provide better approach roads.

Gov. J. Caleb Boggs of Delaware wants to use the bridge tolls to finance approach roads on the Delaware side.

Gov. Robert Meyner of New Jersey wants to get some of the tolls to finance approaches in his state. Each governor has appointed four men to study the problem and try to come up with a joint recommendation.

• **Joint arrangement**—The bridge was financed and built by Delaware, under an agreement with New Jersey that tolls would pay off the debt by 1978, when the bridge would become free. The bridge has attracted such a volume of traffic since it was opened in 1951, however, that it is expected the $48-million issue could be paid off by 1960.

Now Delaware wants New Jersey to agree to a plan by which the bond issue would be refinanced and tolls continued indefinitely to pay off a $130-million issue to finance new limited-access highways in Delaware. There roads would connect the Delaware Bridge with the Chespeake Bay Bridge and with similar superhighways planned in Maryland and Pennsylvania.

Before this can be done, however, legislatures of both states and Congress would have to approve.

• **Some for N. J.**—Meyner says his state is not opposed to the plan. But it would like to get a portion of any new bond issue to pay for approach roads on the New Jersey side.

Railroad and Town Team Up To Bring in Chrysler Plant

There's a story behind Chrysler Corp.'s decision to build its $85-million body stamping plant in the little town of Macedonia, Ohio, near Akron. The town and the Pennsylvania R.R. teamed up to provide the two things that Chrysler felt the location needed—an adequate water plant and a sewage disposal plant. Construction will start within 60 days on plant, located on a 300-acre site zoned for industry.

Lester Miller, chairman of Macedonia's Citizen Advisory Committee, says the town got the Pennsylvania R.R. to guarantee the water plant. A private company probably will build the plant, and the town has guaranteed to buy it back over a five-year period out of the increased taxes from the Chrysler plant. The plant will need about 500,000 gal of water daily. Fortunately, the area near the site is full of underground lakes and wells.

• **Favorable factors**—Among other factors considered in selecting the location—which is a mile from Macedonia on Route 8 and about three miles north of the Ohio Turnpike—was near to steel supplies and good labor conditions. Chrysler already buys a large share of its steel in Youngstown and has a stamping plant there.

Actually, it was Ford's new stamping plant at nearby Walton Hills that did much to get Macedonia interested in bringing in industry. The Walton Hills plant was outside of the town, but it brought in plenty of new residents. Macedonia had to build a new school, and boost its tax rate sharply.

Several Companies Announce Big Plans for Expansion

As if to reassure anyone who might be worried about the future of the business boom, several companies announced big expansion plans last week.

The biggest single program was announced by Rochester (N. Y.) Gas & Electric Co., which said it will spend $100 million on new construction over the next five years because of the expected growth of the area. President Alexander M. Beebe listed among reasons for expansion: construction of a new civic center, inner and outer traffic loops, arterial highways, an expanded water system, new hotels, schools, bridges and hospitals.

• **Other Plans**—Kaiser Aluminum & Chemical Corp. says it's going to spend $90 million on expanding five plants. About $75 million of this will go toward enlarging and completing the Ravenswood (W. Va.) rolling mill, now under construction.

Armco Steel Corp. announces it will step up a previously announced $60-million expansion program by an additional $51 million. Ford Motor Co. will spend $50 million for engineering facilities. Aluminum Ltd., Canadian producer, will spend $17 million doubling its bauxite-processing facilities in the British West Indies Island of Jamaica. And Timken Roller Bearing Co. of Canton, Ohio, will spend $12 milllion to modernize and expand its production capacity.

Bay Bridge Repays Loans From State Highway Fund

Because toll revenues of the San Francisco-Oakland Bay Bridge are doing well, construction dates of many state highway projects are being advanced at least a year.

That's because the California Toll Bridge Authority took steps last week to repay advances made from the State Highway Fund for operation and maintenance. From now on, the State Highway fund will be relieved of maintenance charges running about $1 million a year. The result is that the Highway Department will be able to increase its current and 1956-'57 budgets for northern California projects by a total of $17 million.

Work in Place Makes New Records in September

Dollar value of construction put-in-place during September rose to a record total of slightly more than $4 billion, according to estimates made by the Department of Commerce and Labor.

This was the fourth straight month in which construction volume has reached new highs.

Total value of work put-in-place for the third quarter was a record $11.9 billion—about 9% above the previous record quarter in the same period last year. Seasonally adjusted, this is at an annual rate of about $42 billion, compared with actual volume of $37.5 billion last year. So far this year, work in place totals $31 billion—12% above the same 1954 period.

The government report noted that commercial building, plant construction, schools and highways all reached new highs during September.

Florida Drops Bid Bonds For Bidding on State Work

After having some trouble collecting on bid bonds where original low bidders proved unable to qualify for performance bonds, Florida now requires contractors bidding on state construction work to post certified or cashiers' checks. For many years, the State Road Department has been requiring certified checks.

At the present time, many states do not allow contractors to post bid bonds when bidding on public work contracts.

In road construction, for instance, states allowing bid bonds are in the minority.

(*B&F continued on page 82*)

This cattle pass, on the Gales Creek Section of Oregon's new highway project, is one of many units fabricated of Beth-Cu-Loy galvanized steel culvert stock by Beall Pipe and Tank Corp., Portland.

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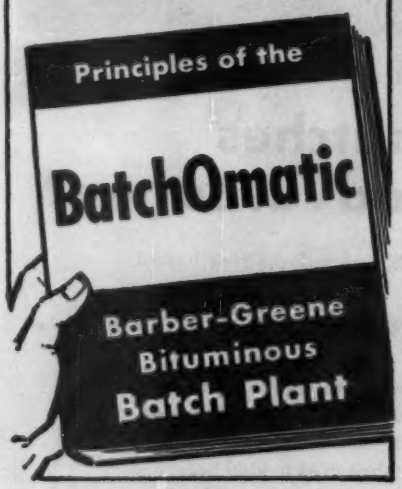

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BUSINESS AND FINANCE

Business Briefs . . .

• **A series of Puget Sound bridges** west of Seattle is not financially feasible right now, investment bankers have just reported to the Washington Toll Bridge Authority. They suggest the project be reviewed in the 1960s, when traffic should have increased in the area.

• **Price boosts**—International Harvester Co. has boosted suggested list prices on tractors and engines about 7%, and about 6% for heavy-duty motor trucks and service parts.

• **New Chicago 20-story building** on Michigan Ave. is planned by the New York real estate firm of Collins Tuttle & Co.

• **Plenty more prospects**—The Veterans Administration reports that only 22% of the 18.5 million veterans eligible for GI mortgages have so far used this privilege.

• **Caterpillar Tractor** earned about $15.4 million during the first half, compared to $12.6 million during the same 1954 period. Sales were $251 million, compared with $198 million during the 1954 half. But the profit margin was 6.15% this year, lower than last year's 6.37%.

• **Pipeline**—Interprovincial Pipe Line Co., of Toronto, will spend $9 million on increasing capacity of the line between Cromer, Manitoba, and Clearbrook, Minn.

• **Branch capitols**—Florida's Development Commission will look into the feasibility of building "branch capitols" in Miami, Orlando, Tampa, and Pensacola. The commission was authorized to finance buildings by selling revenue bonds. Right now, the state is paying $500,000 in rent each year for office space outside the capital city of Tallahassee.

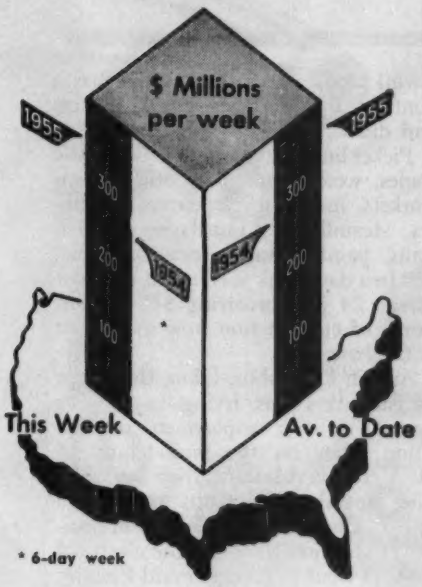
• **Du Pont** plans a multi-million addition to its tetraethyl lead and Freon plants already under construction at Antioch, Calif. Design and construction will be by own forces.

• **Kaiser Steel Corp.** will carry out a multi-million-dollar expansion of its iron ore mining facilities at Eagle Mountain, Calif.

• **National Tea Co.** plans to build 100 new or relocated supermarkets between now and the end of 1956, at a cost of $25 million.

Activity This Week

As reported to ENR
(In millions of dollars)



* 6-day week

Amount of contracts let

(millions of dollars)

	This Week	Cumulative 41 wks 1955	1954	% chge
By Ownership				
Federal	$32.4	$1,333.7	$980.6	+36
State and municipal	54.7	4,259.9	3,896.6	+9
Total public	117.1	5,593.6	4,877.2	+15
Total private	228.7	9,350.9	6,403.3	+46
U. S. Total	$345.8	$14,944.5	$11,280.5	+32
By type of work				
Waterworks	$7.7	$215.2	$188.9	+14
Sewerage	7.0	318.5	296.7	+7
Bridges	8.9	390.9	403.7	−3
Highways	35.6	1,751.8	1,504.8	+16
Earthwork, waterways	4.7	414.0	240.8	+72
Buildings:				
Public, excl. hsg.	41.1	1,380.2	1,384.2	−0.3
Public housg.	1.2	221.7	187.9	+18
Private housg.	129.5	5,065.9	3,335.7	+52
Commercial	25.9	1,324.9	1,064.2	+24
Industrial	67.5	2,241.8	1,505.9	+49
Unclassified	16.7	1,619.6	1,167.7	+39
U. S. Total	$345.8	$14,944.5	$11,280.5	+32

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)

	Week of Oct.6	Cumulative 40 Wks 1955	1954	% Chge '54-'55
Corporate securities	$115.0	$2,725.9		+30
State and municipal:				
All except housing	126.1	3,215.0		−23
Housing	...	72.0		−21
Federal loans	2.1	110.0		+17
Federal aid	...	853.5		+27
Total nonfederal	$243.3	$6,976.3		−5
Federal appropriations:				
In U. S.	...	$3,379.7		+63
Outside U. S.	...	84.6		+155
Total new capital	$243.3	$10,440.6		+11

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost *	10/6	673.76	323.88	141.24
	9/29†	673.95	323.97	141.28
Building cost	10/6	479.86	259.40	136.41
	9/29†	480.05	259.50	136.46
Volume	Sept.	576	234	166
	Aug.	508	207	147

† Official ENR Index for Oct.

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East River, New York City	Consolidated Edison Company
Shelton Well Field	Bridgeport Hydraulic Company
The Connecticut Expressway	Ammann & Whitney, Engineers
Casco Bay Power Project	Central Maine Power Company
Delaware River Power Project	Jackson & Moreland Co., Engineers
Southeast Expressway, Mass.	Massachusetts Dept. of Public Works
Narrows Bridge Site, Brooklyn & Staten Is., N. Y.	Ammann & Whitney, Engineers
125th Street Bridge Site, N. Y. C.	Ammann & Whitney, Engineers
Narragansett Bay	New England Power Service Company
Baker River (Wash.) Hydraulic Development	Stone & Webster, Engineers
St. Lawrence Power Project	Sanderson & Porter, Engineers
Massachusetts Turnpike	Howard-Needles-Tammen & Bergendoff, Engineers
Garden State Parkway, New Jersey	Goodkind & O'Dea, Engineers
The Connecticut Expressway	Loomis & Sullivan, Engineers
The Connecticut Expressway	Knappen-Tippetts-Abbett-McCarthy, Engineers
Portland, Pa. Power Plant	Metropolitan Edison Company

Engineers planning heavy construction no longer need put up with spotty data about the subsoil. Gahagan (a leader in hydraulic dredging since 1898) now has seismic survey crews covering the country, using portable equipment. They provide a continuous and accurate picture of bedrock and the nature of the overburden—quickly, inexpensively. For further details, write, wire or telephone Ken Sandbach, Vice President, Geophysical Survey Division, Gahagan Construction Corp., 90 Broad St., New York 4, N. Y. Telephone: Whitehall 3-2558.

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Nonunion Labor: The Cost Is Often High

Strikes, picket lines and boycotts plague contractors as the building trades protest open shop affiliations

Last week, contractors and members of the building trades across the country were hearing again the now familiar echoes of union security—one of the most fundamental and challenging issues on the labor front.

Among the developments that were adding to construction costs and delays, as the struggle for union recognition continued, were these:

• In Dover, Md., employment of nonunion labor stalled $17 million worth of construction at the Dover Air Force Base, and in Columbus, Ohio, the Corps of Engineers was up against a similar problem on a VA project.

• On the West Coast, Cisco Construction Co. emerged victorious in a secondary boycott case against four of the building trades that entered into a "joint venture," and in Oregon the AFL put religious beliefs ahead of union security.

• In Detroit, the Building and Construction Trades Council spoke out against the activities of the Committee for Constitutional Government and the National Small Business Men's Assn., which it said are engaged in an attempt "to cripple the free trade union movement at the next session of Congress" through an amendment to the Taft-Hartley Act, outlawing the union shop.

Through them all run a common and provocative thread—the extent of labor's "full freedom of association," of its "right" to engage in "concerted activities" for mutual aid or protection.

• **Some new twists**—Most unusual of all was the new labor contract between Arthur M. Gilbert & Sons Construction Co., Eugene, Ore., and the Eugene Building Trades Council. The agreement permits several company employes to work on Gilbert jobs without becoming union members.

The compromise was reached after the company had refused to sign a union contract because the Gilberts and some of the employes are Seventh Day Adventists. In lieu of union dues, members of the faith, who will receive the advantages of union pay and working conditions, may contribute an equal amount to selected charities.

Almost as unusual was the pinning of a joint venture label by the NLRB on union activities that occurred near Seattle during construction of two guided missile sites by Cisco Construction Co., an open-shop contractor.

In an attempt to secure unionization of Cisco employes, the Seattle District Council of Carpenters picketed the construction sites; a roving picket was used to upset the flow of cement and concrete blocks from Cisco suppliers; and members of teamster, operating engineer and hod carrier locals lent their support through various attempts to induce the cement suppliers not to deal with Cisco.

Ruling that the activities constituted an illegal secondary boycott, the NLRB held the four unions responsible for each other's acts. The board's reasoning was this: Cisco's operations on a nonunion basis were a matter of concern to all unions; object of the carpenters' activity was clear; manifest purpose of the other unions was to implement the carpenters' activity; all were directed toward the same end; the result was a joint venture relationship.

• **More trouble**—Critical effects of the same problem were still being felt last week by contractors at the huge Air Force Base in Dover, Md., as they eased out of a two-day strike over the hiring of nonunion labor by the D. K. Parini Construction Co., which has a contract for installing curbs, gutters and drains.

Picket lines, established by two of the trades, were honored by other union workers, including carpenters, plumbers, steamfittters, bricklayers, electricians, painters and cement finishers. For two days work was halted on most of the 24 jobs involving $17 million worth of construction now in process at the base.

And in Columbus, Ohio, the Corps of Engineers was trying to solve a controversy over employment of nonunion labor on the remodelling of the Veterans Administration building. The general contract was awarded to Tuller Construction Corp., an employer of union labor but the electrical contract went to Jesse Howard Electric Co., a nonunion shop. A picket was placed on the project, reportedly for organizing purposes.

Spare-Time Work Under Fire

In an effort to tighten up on the use of nonunion labor, the Cincinnati Building Trades Council has taken a shot at off-duty activities of city employes.

Through its secretary, John W. Kneidl, it has registered a protest with the City Civil Service Commission against the practice of permitting nonunion city employes to engage in building trades in off-duty hours. From this has stemmed the suggestion that regulations governing outside employment by city workers be amended to make permits for such employment subject to commission review.

Kneidl has urged that permission for municipal employes to do spare-time work in a building trade should be granted only to employes holding appropriate union cards.

Plumbers Quizzed

Codes and regulations are assailed in two states

The regulation of plumbers and the plumbing industry has hit the spotlight in Arizona and Illinois, raising the possibility of new and more rigid restrictions affecting both plumbers and contractors.

Focal point of the interest in Arizona are violations of the plumbing code that occurred during construction of the $4.5-million, nine-story building for the First National Bank of Arizona in Phoenix. Just as the first tenants were moving in, portions of the building were closed until the violations—installation of service weight instead of extra-heavy weight soil pipe—were remedied.

As a result, the license of the plumbing subcontractor was suspended; the company's superintendent was recommended for criminal prosecution; its foreman was barred from the trade for 90 days; and five journeymen plumbers were put on probation for six months.

In the course of the investigation, bank officials have criticized the delay in bringing the violations to light and the chief of plumbing inspectors has pointed to the impossibility of covering all jobs adequately.

At the same time, journeymen, critical of the revised code that makes them responsible for violations, said they had to choose between participat-

(Continued on page 86)

Announcing

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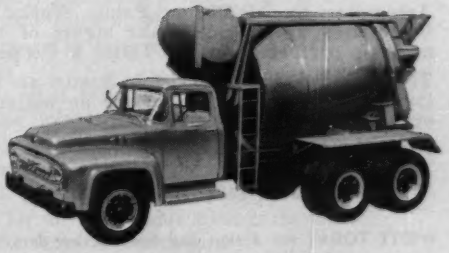

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ing in the violations or losing their jobs. According to one of the examiners, it's the "little guy" who takes the rap.

And in Illinois, Governor Stratton has signed into law a bill which establishes a nine-man board "to make a thorough study of legislation needed for the regulation of plumbing and plumbers."

Painters Yield on Rollers But Win a Higher Wage Rate

A month-long painters' strike by members of Local 118 in Louisville, Ky., has ended with agreement on a new two-year labor contract that grants a 25-cent boost in basic rates and raises travel allowances.

Settlement of the biggest issue—use of roller applicators—permits rollers on government projects only. Contractors had sought a wider use in order to give owners "a quicker job for less money." The painters had hoped to ban them completely.

Under the contract, members of the local received an immediate 7.5-cent wage boost, pushing the journeymen rate to $2.72½, with 7.5 cents more in March and another 10 cents next September.

Labor Briefs . . .

• **Shortage of roofers**—Addressing the Seventh Annual Southern States Apprenticeshop Conference, W. F. Patterson, Director of the Bureau of Apprenticeship, said the current trend toward ranch-type homes, garden apartments, and single story industrial structures is producing an increasingly critical shortage of skilled craftsmen in the roofing industry.

• **More revenue?**—The City Council in Columbus, Ohio, has been told the city is losing close to $750,000 a year through work done without city permits and by unlicensed workmen. Suggested solution: Require contractors to put their firm name on service trucks, so they can be easily spotted and checked.

• **Prevailing wages upheld**—A Baltimore ordinance providing for payment of minimum wages on local public works projects has been upheld. In a court action initiated by two open-shop contractors, the court ruled the ordinance does not constitute unlawful interference with liberty of contract. It also held that the existing and now effective schedule of wages is both "workable and practical . . . and that is all the law requires."

ABC...and the Reader

BACK IN 1914—forty-one years ago—a group of advertisers, advertising agencies and publishers joined in a project that has come to mean a great deal to the millions who, like you, read business magazines. The project, initiated at a time when circulation claims were rarely verified, was intended to achieve and maintain higher standards of integrity in publishing and advertising practice by providing means to audit paid circulation. Out of that effort came an organization known as the Audit Bureau of Circulations, a voluntary, non-profit, cooperative association, known for short as ABC. Its symbol appears at the head of this page.

We are proud that McGraw-Hill publications were among the founders and charter members of the Audit Bureau of Circulations.

Today the Bureau numbers 3,670 members. These include advertisers, agencies, and publishers of newspapers, farm papers, general magazines and business journals such as this one. These publisher members hold their memberships and their right to display the ABC symbol in their publications only so long as they live up to the circulation standards that are established through the Bureau.

It is one thing to set up high standards; it is another to see that those standards are maintained. This latter and all-important function is performed by a staff of auditors maintained by ABC to check periodically on the circulation practices of the publisher members. When a business magazine, such as this one, joins the Bureau it agrees that the ABC auditors shall have "the right of access to all books and records." Their inspection may dig into the files of original subscription orders, payments from subscribers, paper purchases, postal receipts, arrears of payments, editorial expenses and many other significant items. Sometimes the auditors go behind the records and seek verification of purchase and payment from subscribers themselves.

The information thus obtained and certified by the Bureau then becomes available to the public and constitutes an authoritative report on the publication's circulation practices.

The advertisers and agencies benefit directly from the ABC because it provides a generally recognized factual yardstick by which the circulations of member publications can be measured and appraised. Every paragraph in an ABC report on a business publication gives the advertisers data that help them make intelligent use of the publication as an advertising medium.

But the ABC renders a service of vital concern to the *reader* as well. The Bureau audits paid circulation only, and it is through this payment, whether by subscription or newsstand purchase, that the reader keeps the editorial policy of a publication responsive to his needs. His decision to buy or not to buy records his judgment on each publication, and the ABC-audited and certified circulation reports make the sum of these judgments known to all concerned.

So the editors of ABC publications must constantly keep their editorial services up to the mark if they are to survive a competition in which the reader's right to buy or not to buy is paramount. Each paid magazine or newspaper will prosper or fail as it wins or loses the voluntary patronage of thousands or millions of readers. And—the ABC is scorekeeper in this vital contest.

Thus the publisher who submits his publication to the supervision and discipline of ABC affirms in the strongest possible manner his recognition that his primary obligation is to his readers and that he owes the standing of his publication to a voluntary demand by those readers.

All this is what makes the ABC brand on a publication so important to its readers. That respected symbol, testifying to the advertising value of the publication, serves also as a constant reminder to all concerned that the reader's willingness to pay for an ABC publication is the basic reason why it stays in business.

McGraw-Hill Publishing Company, Inc.

SEARCHLIGHT SECTION

OFFICIAL PROPOSALS

Bids: October 27, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 27th day of October 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y.						
Schenectady	R.C. 55-74	Barge Canal, Lock Nine Connection, S.H. 1682	0.16	Open Mesh Bridge Decking and Cleaning & Painting Bridge=0.14 Mi. Asph. Conc., Opt.=0.02 Mi.	$9,000 Plans $10	$165,000
Washington	FARC 55-75	Thomson-Fort Edward, Pts. 1 & 2, S.H. 1685-A Project No. F-391(12)	0.63	Asp. Conc., Opt. Comp. Plate Girder 144'	$16,000 Plans $10	292,000
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 North Genesee Street, Utica 1, N. Y.						
Montgomery	U.S. 90	Lock 10 Erie Canal	....	Lower the Lower Sill and Floor of Lock Chamber; Replace Upper Sill; Install New Upper and Lower Gates Misc. Work	5% of Bid Plans $10	Not Published
DISTRICT No. 3, WM. ROBINSON, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Cayuga	S.T. 55-12	New York State Thruway-Ontario Section-Subdivision 4 County Road No. 116	0.60	Asp. Conc., Opt. R.C. Open Box Twin 33' Span	$6,500 Plans $10	115,000
Onondaga	M-55-4	Barge Canal Terminal City of Syracuse	....	Furnish & Erect 7,000' of Woven Wire Fence and 6 Single and 1 Double Gate	$1,200 Plans $10	21,800
Tompkins	FASS 55-8	South Lansing-Peruville, C.R. 107 Project S-283(2)	5.43	Bit. Mac. Opt.	$20,000 Plans $10	363,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court Street, Buffalo, N. Y.						
Chautauqua	E.T. 55-10 S.T. 55-11 R.C. 55-73	New York State Thruway-Erie Section Subdivision E-1A (Penn. State Line to Barden Road); Ripley-Sherman Pt. 1, S.H. 1297 and Two Secondary Cross Roads and Access Roads	5.27 (3.19) (Acc.)	9" Two Crse. Cem. Conc. Pavt. 2@ 25' Wide=5.23 Mi. Asp. Conc., Opt.=3.16 Mi. Misc. Work=0.07 Mi. 3 Hy. Seps. Comp. I-Beam 283.3', 260' & 280.5'	$196,000 Plans $50	3,565,000
Chautauqua	E.T. 55-11 E.T.C. 55-12 R.S. 55-77 S.T.C. 55-14 S.T. 55-13	New York State Thruway-Erie Section Subdivision E-3B (Dunkirk-Pomfret Town Line to Fredonia, Roberts Rd.); Bennett Road Interchange; Roberts Road S.H. 857 and Seven Secondary Cross Roads and Streets	3.48 (4.47) (Acc.)	9" Two Crse. Cem. Conc. Pavt. 2@ 25' Wide=5.22 Mi. Asp. Conc. Ty. 2B=0.07 Mi. Asp. Conc., Opt.=1.40 Mi. Bit. Mac. Ty. 1=0.83 Mi. Bit. Treated Gravel=0.41 Mi. Misc. Work=0.02 Mi. 6 Hy. Seps. Comp. I-Beam 378.7', 254.9', 270.8', 335.7', 221.9' and Twin 36.2' Each 1 RR Sep. I-Beams-Twin 213' Each	$260,000 Plans $100	4,711,000
Erie	GISP-RC 55-1	Grand Island State Parkway-South Parkway and West River Parkway (E. Service Road)	2.57	Asp. Conc., Opt.	$1,500 Plans $10	28,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, N. Y.						
Clinton	R.C. 55-76	Rouses Point Village, S.H. 5228	1.07	Erosion Control=0.96 Mi. Misc. Work=0.11 Mi.	$6,000 Plans $10	104,000
Franklin	M-55-5	Lower Lock in Saranac River	....	Furnish New Gate; Resurface Walls with Pneumatically Projected Conc.; Stone Rubble Masonry and Three New Timber Docks	$2,100 Plans $10	39,136
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Ulster	FASS 55-4	Rosendale-Tillson, C.R. 113 Project S-423(1)	0.08	Asp. Conc. Opt. Comp. Girder 126'6" Span and Conc. Slab 26'9" Span	$17,000 Plans $10	305,000
Westchester	Chp. 103, Laws 1945, Sec. 11 Chp. 52, Laws 1955, Sec. 10	N.Y.S.D.P.W. Storehouse Site Town of Mt. Pleasant		Grading, Paving and Fencing	$2,400 Plans $10	44,000
Westchester	H.T. 55-8	New York State Thruway-Hudson Section-Sub. 9B (Tappan Zee Bridge)	....	Construction and Repair of Ice Breakers	$125,000 Plans $10	2,272,000
Westchester	H.T. 55-9 S.W.C. 55-1	New York State Thruway-Hudson Section-Sub. 10 Southern Westchester Connection Sub. 11	....	Furnish & Install 32,400 L.F. Beam Type Guide Railing	$5,500 Plans $10	100,000
DISTRICT No. 10, M. E. GOUL, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., N. Y.						
New York	CBE-RC 55-2	Cross Bronx Expressway Cont. 13C, FACBE 50-1 (Highbridge Interchange)	0.13	Removal of Exist R.C. Pavt. & Asp. Conc. Opt.	$1,100 Plans $10	20,000
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y. DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Westchester, Rockland & Schenectady	T.R.T. 55-1 Hudson Section-Sub. 9A and Mohawk Section-Sub. 1	New York State Thruway-Southern Westchester Connection-Sub. 11	....	Furnish & Install Three Emergency Generators	$600 Plans $10	11,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: October 25, 1955

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
POWERHOUSE HEADWORKS AND TAILRACE STEEL STOPLOGS

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario and clearly marked
"TENDER FOR ST. LAWRENCE POWER PROJECT
POWERHOUSE HEADWORKS AND TAILRACE STEEL STOPLOGS"
will be received up to 4:30 p.m. Eastern Standard Time on
TUESDAY, OCTOBER 25, 1955

for the supply, fabrication, delivery and guarantee of 767 tons of steel stoplogs required for the headworks and tailrace of the Ontario Hydro powerhouse.

Delivery of all the stoplogs is required on or before September 1, 1957.

Copies of the tendering documents may be obtained on or after September 29, 1955, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of $10.00 for each set. This charge will be refunded on return of the documents in good condition.

Tendering documents may be inspected at the above location and at the offices of the following: The Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.

The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

U. S. Government

Department of Commerce, Bureau of Public Roads, October 5, 1955. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., NOVEMBER 3, 1955, for Project 2L7-2M9-2P6, Blue Ridge Parkway, Buncombe, McDowell, Mitchell and Yancey Counties, North Carolina. Concrete tunnel lining, stone masonry portals and other work. Aggregate length: 0.062 mile. The approximate quantities of the more important items are: 560 cu. yd. Concrete, 250 lin. ft. Concrete Tunnel Lining, 103,000 lb. Reinforcing Steel and 276 cu. yd. Stone Masonry. Minimum wage rates have been fixed as required by law. Plans, specifications, and proposal forms are available upon request at the address given above or Bureau of Public Roads, 920 South Jefferson Street, Roanoke, Virginia. H. J. Spelman, Division Engineer.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4533) will be received at Denver, Colorado, until December 1, 1955, for furnishing and installing new armature windings in three existing 75,000-kva, 13,800-volt, 138.5-rpm, 3-phase, vertical-shaft generators, Shasta Power Plant, Central Valley Project, California. Location near Redding, California. Completion time 120; 350; and 460 days for the first, second, and third units, respectively. For particulars, address Bureau of Reclamation, P. O. Box 471, Redding, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Department of Commerce, Bureau of Public Roads, September 30, 1955. SEALED BIDS will be received at the office of the Park Superintendent, Homestead, Florida, until 11:00 a.m., E.S.T., OCTOBER 28, 1955, for Project 1A5, Everglades National Park, Dade County, Florida. Excavation of oolite rock borrow and construction of roadway embankments, processing oolite rock base, bituminous prime and surface treatment, seeding and other work from near Nine Mile Bend, 3.977 miles to near West Lake. The approximate quantities of the more important items are: 50,000 cu. yd. Marsh Excavation, 520,000 cu. yd. Excavation for Borrow, and 2,000,000 half mile-cu. yd. Overhaul. Minimum wage rates have been fixed as required by law. Plans, specifications, and proposal forms are available upon request at the offices of the Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, and Gatlinburg, Tennessee. H. J. Spelman, Division Engineer.

Department of Commerce, Bureau of Public Roads, October 4, 1955. SEALED BIDS will be received at the office of the Bureau of Public Roads, First National Bank Building, Florence, Alabama, until 10:00 a.m., C.S.T., NOVEMBER 4, 1955, for the construction of Project 3W5-3W6, Natchez Trace Parkway, Adams and Jefferson Counties, Mississippi. Asphalt concrete pavement with stabilized turf shoulders, relocation of county roads, construction of parking areas, and other work from Route U. S. 61 to Mississippi Route 553. Aggregate Length: 17.154 miles. The approximate quantities of the more important items are: 121,200 cu. yd. Excavation and Borrow, 23,500 cu. yd. Gravel, 800 cu. yd. Concrete and 19,000 tons Hot Asphalt Concrete Pavement. Minimum wage rates have been fixed as required by law. Plans, Specifications, and Proposal Forms are available upon request at the address given above, or Bureau of Public Roads, 1440 Columbia Pike, Arlington 4, Virginia. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: October 25, 1955

Contracts 451 and 452

WEST DELAWARE TUNNEL

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Daylight Saving Time, (10:00 A.M., Eastern Standard Time), on Tuesday October 25, 1955, for the following two contracts for the construction of the westerly portion of the West Delaware Tunnel of the Delaware system, comprising about 20 miles of concrete lined pressure tunnel, circular in section and 11 feet 4 inches in finished diameter, and Shafts 1 to 3 inclusive, 14 feet in diameter, which will be circular in section and lined with concrete, all as set forth in the specifications:

CONTRACT 451, for the construction of about 43,000 liner feet of tunnel, including an intake channel and Shaft 1, approximately 520 feet deep, located in the Towns of Tompkins and Hancock, Delaware County, New York.

CONTRACT 452, for the construction of about 60,000 linear feet of tunnel, including Shaft 2, approximately 310 feet deep, and Shaft 3, approximately 460 feet deep, located in the Towns of Hancock and Colchester, Delaware County, New York.

A bidder on both of these contracts may, if he so desires, specify in the bid form of either or both contracts, that he will agree to make a percentage reduction from the total cost of the contract, if both contracts are awarded to him.

Pamphlets of the two contracts containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Chief Clerk's office, Room 1317 at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: October 20, 1955

New Jersey Turnpike Authority

CONTRACT NO. W-14F

Sealed proposals are invited for Contract No. W-14F for the furnishing and installation of the Food Service Equipment in the Service Buildings at Service Areas 6N and 6S on the New Jersey Turnpike, in Mercer County, New Jersey.

The principal items of work include:

Equipment for the preparation, storage and service of food.

Dishwashing equipment, soiled and clean dish counters and related equipment.

Dairy counters, stools, counter units and related equipment.

Back bar, back bar units and related equipment.

Mechanical refrigeration and interior equipment for walk-in refrigerators (walk-in refrigerators are not included).

Chilled water system equipment.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11 O'Clock Eastern Daylight Saving Time, on the morning of October 20, 1955, at which time and place said proposals will be publicly opened and read.

Bidders must submit with their proposal a Contractor's Financial and Equipment Statement.

Contract Documents may be examined during office hours after October 6, 1955, at the office of the Authority, and at the office of the Consulting Architects, Lorimer & Rose, 254 West 54th Street, New York 19, N. Y. Contract Documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract Documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

October 3, 1955

Bids: October 17, 1955

City of Fort Pierce, Florida

SITE OF SEWAGE TREATMENT PLANT

SEALED PROPOSALS will be received by the City Manager, City of Fort Pierce, Florida, until 5:00 P.M. (Eastern Standard Time) on October 17, 1955, and opened by the City Commission at a meeting starting at 7:30 P.M. on this date in the City Hall, Fort Pierce, Florida, for the construction of a site for a sewage treatment plant, said construction involving hydraulic fill, bulkheading, paving, a sewage force main under water, and an outfall line.

All material and equipment furnished and all work performed shall be in accordance with the plans, specifications and contract documents pertaining thereto, which may be examined at the office of the City Manager, Fort Pierce, Florida, and at the office of Reynolds, Smith and Hills, Architects and Engineers, 227 Park Street (P.O. Box 4817) Jacksonville, Florida. Plans and specifications may be purchased from Reynolds, Smith and Hills, Architects and Engineers, for the sum of $5.00 per set, which will not be refunded. Individual copies of the specifications and partial sets of drawings may be procured for $2.00 per copy and $0.50 per sheet respectively, not refundable.

A Bid Bond properly executed by the Bidder and by a qualified Surety, or a certified or cashier's check on any National or State Bank, in a sum not less than five (5%) percent of the amount bid, made payable to the City of Fort Pierce, Florida, must accompany each bid as a guarantee that the Bidder will not withdraw from the competition after opening the bids, and in the event the contract is awarded to the Bidder, he will, within ten (10) days thereafter, enter into contract and furnish the required bond, failing which he shall forfeit deposit as liquidated damages. The Bid Bond and Performance Bond are required to be secured from an agency of the surety or insurance company, which agency shall have an established place of business in the State of Florida and be duly licensed to conduct business therein.

Each bid shall be addressed to the City Manager, Fort Pierce, Florida, marked "Site for Sewage Treatment Plant, City of Fort Pierce, Florida", and delivered to the office of the City Manager, City Hall, Fort Pierce, Florida, either by a representative of the bidder who shall obtain a receipt therefor or by registered mail with return receipt requested.

The City reserves the right to waive informalities in any bid; to reject any or all bids in whole or in part, with or without cause, and/or to accept the bids that in its judgment will be for the best interests of the City of Fort Pierce, Florida.

CITY MANAGER
CITY OF FORT PIERCE, FLORIDA

Bids: October 26, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF FIXED HOIST ASSEMBLIES
FOR
LONG SAULT DAM
SPECIFICATIONS NO. PA-5-15076
ST. LAWRENCE CONTRACT NO. P28

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the manufacture and furnishing of eighteen (18) Fixed Hoist Assemblies for Long Sault Dam and delivery thereof f.o.b. the Authority's classification yard, Massena, New York in the following ways:

(1) If brought in person, on the day of receiving bids until 10:30 A. M. Eastern Daylight Saving Time on the 26th day of October, 1955, 270 Broadway, Hearing Room C on the sixth floor, New York 7, New York.

(2) If mailed in, until 10:15 A. M. Eastern Daylight Saving Time, on the 26th day of October, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposal will be publicly opened and read aloud at the time and at the address given in (1) above.

Bids will be entertained for eighteen 175 ton fixed hoists and accessories together with the structural steel supporting structures and towers upon which the hoists are mounted.

Bids will not be restricted to American manufacturers.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Twenty ($20.00) dollars per initial set of contract documents and Ten ($10.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the maximum price bid for any bid schedule.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

September 23, 1955

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work
Civil Service Opportunities....
Selling Opportunities Wanted
Selling Opportunities Offered
Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED —RATES— **UNDISPLAYED**

The advertising rate is $24.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$1.00 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS to ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y. for October 27th issue closing October 17th.

DESIGN ENGINEERS

PERMANENT OPENINGS FOR QUALIFIED ENGINEERS EXPERIENCED IN DESIGN OF:

STRUCTURAL STEEL
REINFORCED CONCRETE

APPLICABLE TO DESIGN OF BRIDGES, BUILDINGS, TEST FACILITIES, AND GENERAL INDUSTRIAL STRUCTURES.

also

PIPING DESIGN & LAYOUT
HEATING & VENTILATING
POWER AND LIGHTING

APPLICABLE TO DESIGN OF INDUSTRIAL FACILITIES, TEST FACILITIES, POWER PLANTS AND ELECTRICAL INSTALLATIONS.

OPENINGS ALSO AVAILABLE FOR DRAFTSMEN, DETAILERS AND SEVERAL RECENT GRADUATES.

We desire engineers who want long range employment with ample opportunity for professional development and advancement. Employee Benefits Plan plus other attractive features.

Please write fully to

SVERDRUP & PARCEL, INC.
Consulting Engineers
915 Olive Street St. Louis 1, Mo.

ENGINEERING GEOLOGIST

Carry on field investigations and geological studies for portland cement manufacturer for purpose of developing new sources of raw materials and extending knowledge of present deposits. Also, assist in supervision of quality control of company products. Will headquarter in Chicago, but must be free to travel. Will consider recent graduates as well as experienced applicants. Must have degree. Give full details on experience, training, personal data, and salary desired in first letter. Reply to

P-7923, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Construction Foreman for firm engaged in extensive sewer, water main and treatment plant facilities. Permanent position in N. Y. State area. Only qualified applicants with broad experience. P-6595, Engineering News-Record.

Building Construction Superintendent — Wanted at once for large school project in Cedar Rapids. Must be well qualified and experienced. Project duration approximately two (2) years. Position permanent for right man. Write stating qualifications, habits, experience, previous employment, references, availability, and salary expected. Address reply to R. F. Ball Construction Company, Inc., Post Office Box 2300, San Antonio, Texas.

Engineer—young sanitary or chemical, to direct program of state stream pollution control program. Salary $7000.00 per year. Submit education and experience resume West Virginia State Water Commission, 1709 Washington Street, East, Charleston 1, West Virginia.

Dam Engineers, minimum of four years experience in construction and/or design of dams, preferably with a working knowledge of soil mechanics and concrete control for duties involving review of plans and specifications, report writing, field investigations and inspections, with some travel and public relations. Opportunity for administrative experience and advancement. Hydraulic engineers, experienced in design and preparation of contact plans for flood control projects. Will be engaged in long range flood control program. Opportunities for gaining broad experience and for advancement. Location, Pennsylvania. Give full details of experience, education, age, salary expected and references. Address replies to P-7870, Engineering News-Record, 330 W. 42nd Street, New York 36, N. Y.

Structural Steel detailers and checkers— permanent employment offered to qualified men. Please send experience record and salary required to Pittsburgh Des Moines Steel Company, Santa Clara, California.

Assistant Engineer, civil engineering background. Training and experience in one or more of the following: design of subdivisions; sewer and water; streets. This is a career position in a consulting engineer's office. Applicant must be available immediately. Salary to $8000. State experience, education and give references. Lester V. Johnson Associates 2309 Wilson Boulevard Arlington 1, Virginia.

Civil Engineer, research and development— experienced in asphalt pavement construction and with ability to prepare construction specifications and technical manuals. Pleasant living conditions with special employment benefits. Location East Coast. State salary expected. P-7887, Engineering News-Record.

Structural Engineer for building design Ketchum and Konkel, Consulting Engineers, 1090 Fox Street, Denver 4, Colorado.

Engineer to design and write up specifications for fishways, hatcheries, counting weirs, and other engineering projects and to supervise construction of same. For application forms and further details write to Alaska Department of Fisheries, 229 Alaska Office Building, Juneau, Alaska.

(Continued on page 92)

ENGINEERS

HIGHWAYS AND BRIDGES

Designers
Draftsmen
Office Engineers
Maintenance Engineers
Project Engineers
Location Engineers
Soils & Materials Engineers

FIELD SURVEY PERSONNEL

Party Chiefs
Instrumentman
Chainman

OTHER PERSONNEL

Hydrologist
Equipment Supervisor
Master Mechanic

Domestic and Overseas Assignments
Knowledge of Foreign language necessary in some classifications.

Write giving full particulars concerning education, experience, personal history and availability to:

Richard L. Shaw
Personnel Director
Michael Baker, Jr., Inc.
Consulting Engineers
Baker Building Rochester, Penna.

Construction Materials Technician

experienced testing such materials as cement, asphalt, plaster, aggregates, soils, and other general construction materials. Excellent laboratory facilities, pleasant conditions. Permanent position. Opportunity to develop. Send resume and salary expected.

United States Testing Co.
1415 Park Ave. Hoboken, N. J.

HIGHWAY ENGINEERS

Junior positions in California's huge highway program. High level professional experience with excellent promotional oportunities offered to recent college graduates in civil engineering. $395 to start with raise after 6 months. Positions open at this level only. Write for illustrated booklet. Section F. State Personnel Board, 801 Capitol Avenue, Sacramento 14, California.

BRIDGE ENGINEERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:
Detailers—2 years structural steel or reinforced concrete detailing.
Designers—4 years responsible work on structural steel and concrete including work on long span bridges.
Mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

ENGINEERS—DESIGNERS
Chemical—Mechanical—Piping
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P-7950, Engineering News Record
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POSITIONS VACANT
(Continued from page 90)

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Field Office Manager, highway construction, handle payroll, cost, equipment records, etc. Present location, New England, permanent status for right man. P-7918, Engineering News-Record.

Associate City Engineer—for general municipal work. Experience in operation or construction of Sewage and Water Works desirable. Send complete record of education, experience, references, personal data, salary desired and date available to City Engineer, Mankato, Minnesota.

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Of Engineering News-Record published weekly at Albany, New York for October 1, 1955.

1. The name and address of the publisher, editor, managing editor, and business manager is: Publisher, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York, 36, N. Y.; Editor, Waldo G. Bowman, 330 West 42nd Street, New York 36, N. Y.; Managing editor, E. E. Halmos, Jr., 330 West 42nd Street, New York 36, N. Y.; Business manager, Howard T. Olsen, 330 West 42nd Street, New York 36, N. Y.

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EDITORIALS

Urban Highway Work Speeded

ADDING 2,300 MILES to the 37,700-mile National System of Interstate Highways, as has just been done by the Bureau of Public Roads, has greater significance than the mere mileage figures because of the location of the new routes. Most of them are in urban areas where better main highways are badly needed, and yet where right-of-way and construction costs are so high that the mileage that can be built in any one year is small under normal highway-financing procedures.

Making these urban highways part of the interstate system should make them eligible for greatly increased federal aid under the new federal-aid highway legislation that Congress is expected to pass next year. Adding them now has a further advantage of permitting the local authorities to undertake immediately the traffic studies and surveys required to spot the exact locations of the several routes.

Thus the full significance of the BPR action becomes apparent: It not only adds mileage where it is needed but by permitting the surveys to be completed now it sets the stage for quick construction starts following Congressional approval of a new highway act.

No Power Shortage—Ever

CONFIRMATION LAST WEEK by the Atomic Energy Commission that the U. S. is indeed among the countries studying the possibilities of creating a new power source from the fusion as distinct from the fission of atomic particles, as was rumored at the Geneva Conference, can properly be characterized as world-shattering news.

Not that any kilowatts of thermonuclear power are just around the corner. Far from it. But the mere fact that a dream so fantastic that temperatures on the order of a million degrees will be required to make it come true is being taken seriously can only be regarded as remarkable. For if the dream can be translated to reality by using the limitless amounts of heavy hydrogen in sea water as the raw material for the fusion process, the availability of power would also be limitless.

Actually the proved practicability of the atom splitting or fission process as a source of power has already quieted all fears of a power shortage at any time in the imagineable future. Conventional power sources—coal, oil and hydro—can in fact take care of all needs for the rest of this century. But the editors of Nucleonics magazine have also estimated that there will be one million kw of nuclear power plant capability in the U. S. by 1960, and that it is possible that within 25 years nuclear power capacity will be equal to our present generating capacity of 100 million kw.

More power, therefore, would seem to have ceased to be one of the world's pressing problems. Why then look for more under such difficult circumstances as the development of a process for fusing atoms seems to offer? One reason no doubt is man's unquenchable thirst for knowledge, but another is that thermonuclear power may be cheap power; conventionally developed power is not cheap, and nuclear power is even more costly. Finally, however, a controlled fusion process for generating power is most desirable because it would leave no radioactive waste products to be disposed of. It is indeed this disadvantage of the fission process that casts the only real shadow on the power picture of the future.

If controlled fusion can be made to come off—even after 50 years of research—there will be no power shortage—ever. That at least is the vision, and it is one that the construction industry—user of power itself and purveyor to a power-hungry world—should share and help nurture.

Can the "El" Come Back?

ELEVATED RAILROADS as a means of city rapid transit have been on their way out since the first trains left a smoke pall in their wake and disturbed the neighborhood with their racket. Electrification eliminated the smoke and changed the nature of the noise, but did nothing to revive property values in the shadow of the overhead structures. As a consequence Boston, New York, Philadelphia and finally Chicago turned to subways. For at least a quarter of a century the elevated railway has been as unwanted as a wooden sidewalk.

It is, therefore, rather remarkable that just as New York is demolishing the last elevated railway line on Manhattan Island a grandiose plan for a new elevated network should be proposed there, while in Los Angeles and Houston still another proposal is being debated. The latter proposal is for a monorail structure from which the trains would be suspended as they speed overhead. In New York the proposal is even more startling since it is unprecedented: an elevated steel structure carrying a single-lane, troughed concrete deck on which rubber-tired electric trains would run.

Both these designs attempt to overcome some of the disadvantages of the old elevateds. A monorail structure would be less bulky, and suspended trains less noisy. Rubber-tired trains should be even more silent.

Whether the real-estate blight created by the old elevateds could be cut or eliminated is still an open question. Putting the new lines in rights-of-way of their own could at least keep them off the streets and away from the fronts of buildings—more of an economic possibility today than in the past, considering the pressing needs for traffic relief on city streets.

It is, in fact, the tremendous problem of automobile traffic congestion that makes thoughts of elevated railways tenable at all. Given this impetus, however, ingenious designs and thoughtful planning might yet permit the elevated railway to stage a comeback.

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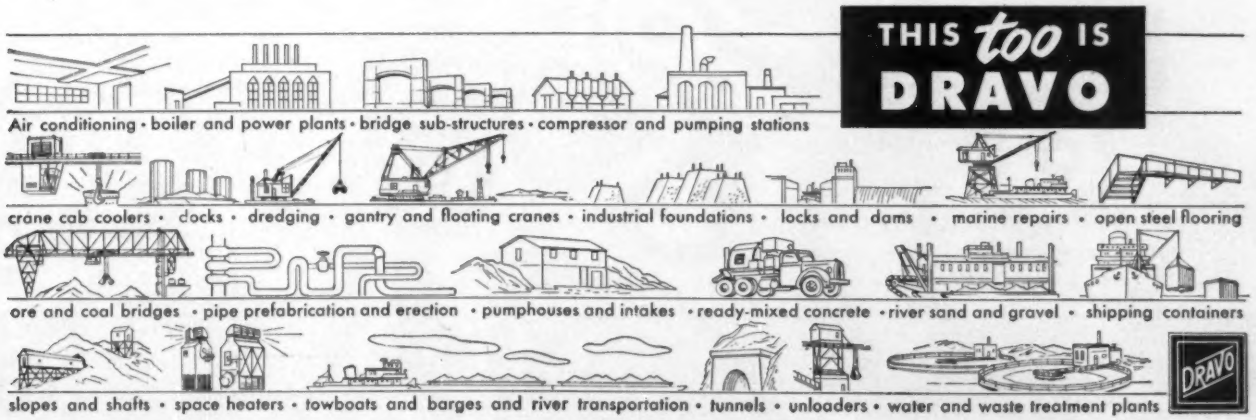
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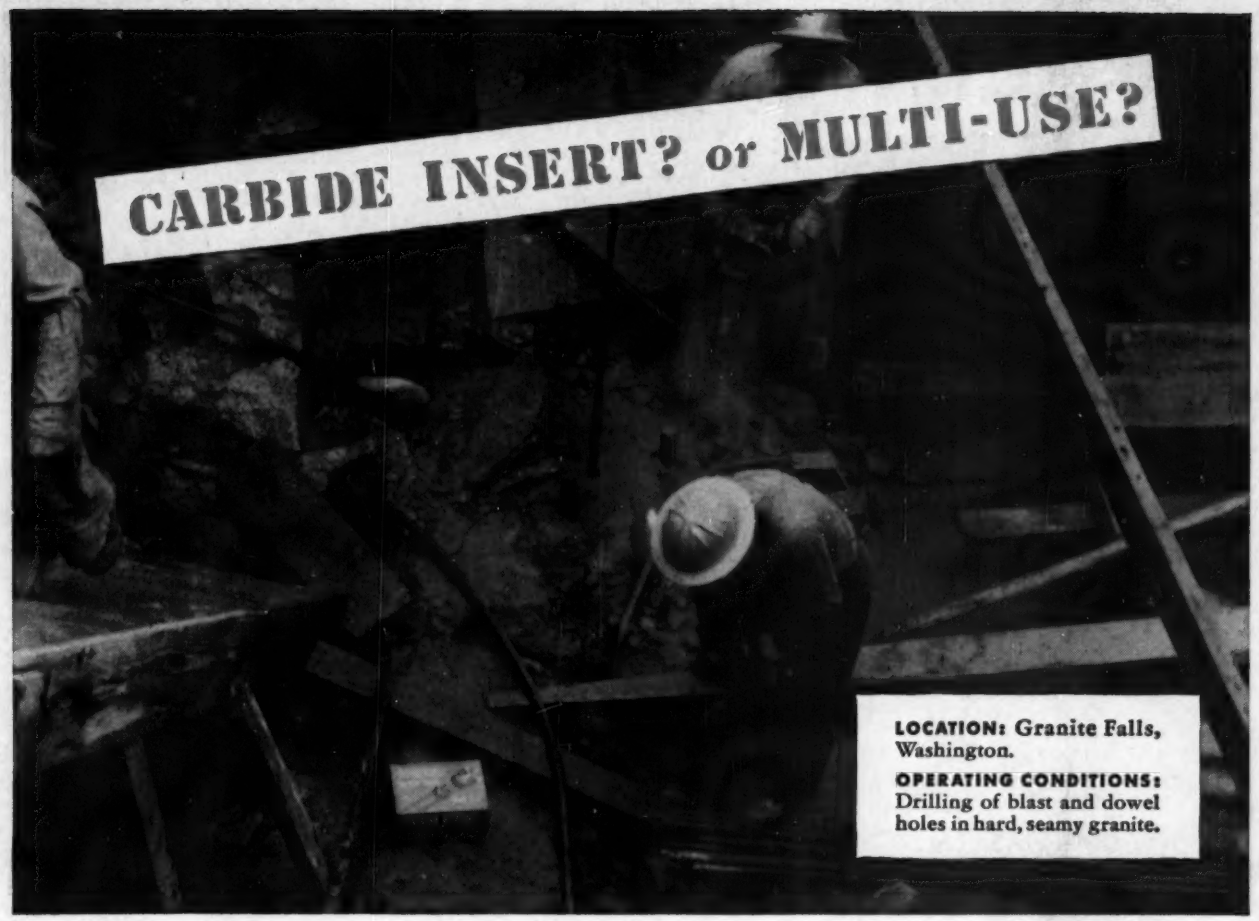
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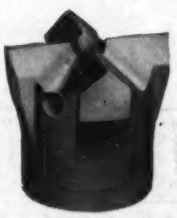

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